

**EXPLORING THE PREDICTIVE POWER OF IN-SERVICE EFL
INSTRUCTORS' INFORMAL TECHNOLOGY USAGE SITUATIONS ON
THEIR TPACK LEVELS**



Büşra YILDIZ

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THEIR TPACK LEVELS**

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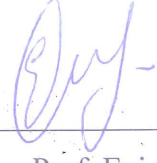
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BÜŞRA YILDIZ

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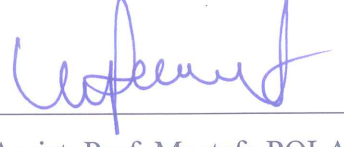
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Assoc. Prof. Enisa MEDE

Director

I certify that this thesis satisfies all the requirements as a thesis for the degree of Master of Arts.



Assist. Prof. Mustafa POLAT

Coordinator

This is to certify that we have read this thesis and in our opinion it is fully adequate, in scope and quality, as a thesis for the degree of Master of Arts.



Assist. Prof. Mustafa POLAT

Supervisor

Examining Committee Members

Assoc. Prof. Enisa MEDE

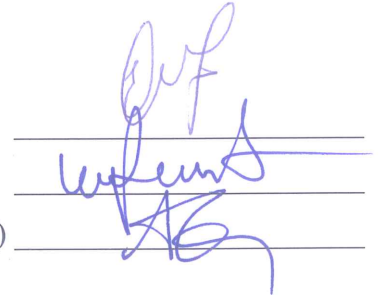
(BAU, ELT)

Assist. Prof. Mustafa POLAT

(BAU, ELT)

Dr. Aslı SAĞLAM

(OZU, SCOLA)



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Name, Last Name : B   ra YILDIZ

Signature :



ABSTRACT

EXPLORING THE PREDICTIVE POWER OF IN-SERVICE EFL INSTRUCTORS' INFORMAL TECHNOLOGY USAGE SITUATIONS ON THEIR TPACK LEVELS

Yıldız, Büşra

Master's Thesis, Master's Program in English Language Education

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The purpose of this study is to find out in-service EFL instructors' technological pedagogical content knowledge (TPACK) levels in order to identify how competent they are with implementing technology efficiently in their teachings, to present their frequency of informal technology use in order to learn their habits of technology use and to determine the predictive relationship between in-service EFL instructors' TPACK levels and the frequency of informal technology use in order to find out whether their informal technology use predicts how they implement technology in their teaching pedagogically to teach their content area. In this study, quantitative method and prediction research design which is a kind of correlational design was implemented after considering the aims of the study. The data of the study were collected through an online questionnaire consisting of TPACK-EFL survey developed by Başer (2015) to determine the in-service EFL instructors' TPACK level and Formal/Informal Technology Use Scale by Wang et al. (2014) to acknowledge the participants' frequency of informal technology use. A total of 105 in-service EFL instructors who were working in either state or foundation universities from Turkey voluntarily took part in this research study. The findings indicated that in-service EFL instructors' frequency of informal technology use took place between 'once or twice a month' and 'once or twice a week' which can be considered as higher

frequencies of informal technology use. Results also showed that in-service EFL instructors had a high level of TPACK. Finally, it was found out that informal technology use moderately predicts TPACK-EFL and they display a significant relationship but not much of the change in TPACK-EFL is explained by informal technology use. Based on these findings, this research study contributes to the literature by relating informal technology usage situations with TPACK for in-service EFL instructors for the first time in English as a foreign language (EFL) teaching field.

Keywords: In-service EFL instructors, Technological pedagogical and content knowledge (TPACK), Informal technology use, Technology in Education, Teacher education in educational technology.

ÖZ

İNGİLİZCE ÖĞRETİM GÖREVLİLERİNİN GÜNLÜK HAYATTA TEKNOLOJİ KULLANIMLARININ TEKNOLOJİK PEDAGOJİK ALAN BİLGİLERİ ÜZERİNDEKİ TAHMİN GÜCÜNE DAİR BİR ARAŞTIRMA

Yıldız, Büşra

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Tez Yöneticisi: Dr.Öğr.Üyesi Mustafa POLAT

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Bu çalışma, İngilizce öğretim görevlilerinin yüksek öğretimde teknolojiyi verimli bir şekilde entegre etme konusunda yeterli olup olmadıklarını ortaya çıkarmak için Teknolojik Pedagojik Alan Bilgisi (TPAB) seviyelerini belirlemek, günlük hayatta teknoloji kullanma sıklıklarını belirlemek ve günlük hayatta teknoloji kullanma sıklıklarının, teknolojik pedagojik alan bilgileri üzerinde tahmin edici bir etkisi olup olmadığını anlamak için yapılmıştır. Bu çalışma nicel olarak yürütülmüş ve bir çeşit korelasyonel araştırma yöntemi olan regresyon analizi kullanılmıştır. Hizmet içi İngilizce öğretim görevlilerinin günlük hayattaki teknoloji kullanım sıklığını ölçmede kullanılan veriler, Başer (2015) tarafından geliştirilen TPAB-YDOİ anketini içeren çevrimiçi bir anket ve Wang vd. (2014)'in resmi/günlük hayatta teknoloji kullanımı ölçeği aracılığıyla toplanmıştır. Araştırmaya Türkiye’de kamu ve vakıf üniversitelerinde çalışmakta olan 105 hizmet içi İngilizce öğretim görevlisi gönüllü olarak katılmıştır. Elde edilen bulgular, İngilizce öğretim görevlilerinin günlük hayattaki teknoloji kullanım sıklığının ‘ayda bir iki kere’ ile ‘haftada bir iki kere’ aralığında olduğunu göstermektedir. Bu aralık günlük hayatta teknoloji kullanım sıklığı açısından yoğun olarak yorumlanmaktadır. Sonuçlar hizmet içi öğretim görevlilerinin yüksek TPAB seviyesine sahip olduklarını da göstermektedir. Son olarak, günlük hayatta teknoloji kullanımının TPAB-YDOİ’i kısmen tahmin ettiği ve aralarında önemli bir ilişki olduğu ancak TPAB-YDOİ’deki değişimin sadece bir

kısının g nl k hayatta teknoloji kullanımı ile a ıklan đı g r lm  t r. Bu  alı ma  ngiliz dili  đretimi alanında hizmet i i  ngilizce  đretim g revlilerinin g nl k hayattaki teknoloji kullanım durumlarını TPAB ile ilk kez ili kilendirerek alana katkıda bulunmaktadır.

Anahtar Kelimeler: Hizmet i i  ngilizce  đretim g revlileri, Teknolojik Pedagojik Alan Bilgisi (TPAB), G nl k hayatta teknoloji kullanımı, Eđitimde teknoloji, Eđitim teknolojisinde  đretmen eđitimi.





To the star who shines brightest,

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LIST OF ABBREVIATIONS

ELT	English Language Teaching
EFL	English as a Foreign Language
ICT	Information and Communication Technologies
CALL	Computer Assisted Language Learning
MALL	Mobile Assisted Language Learning
PK	Pedagogical Knowledge
TK	Technological Knowledge
CK	Content Knowledge
PCK	Pedagogical Content Knowledge
TPACK	Technological Pedagogical and Content Knowledge

Chapter 1

Introduction

In this chapter, first of all, information about the theoretical framework of the study is given. Secondly, the statement of the problem and the purposes of the study are defined. After the research questions of the study are presented, the significance of the research and its contribution to the field are also discussed. Eventually, the definitions of the keywords are given at the end of the chapter.

1.1 Theoretical Framework

As a theoretical framework, the Technological Pedagogical and Content Knowledge (TPACK) was employed in this research to explore how the informal technology use frequency of in-service EFL instructors predicts their TPACK levels. The expectations from the teachers are not only implementing technology effectively but also using technology as a necessity of their profession; they should be able to utilize knowledge of pedagogy, technology and content as a whole (Ocak, 2016). More about this issue, Hargvare and Hsu (2000) argue that in the very early years of educational technology, the teaching process of technological skills was free from pedagogical and content knowledge (Graham, 2011; Graham et. al., 2004). Later on, the understanding of technology could not improve pedagogical and content knowledge (PCK) which was acknowledged, and their integration of all together into the process of learning and teaching was considered (Kaya et. al., 2011). Furthermore, the adaptation of technological knowledge to the pedagogical knowledge which was introduced by Shulman (1986) showed up and the Technological Pedagogical and Content Knowledge (TPACK) was brought out as a new design.

Technological pedagogical content knowledge use aimed to explain the information and competency of teachers concerning how they build a rational pedagogical implementation of technology (Koehler et. al., 2007). TPACK has several various definitions in the literature. Mishra and Koehler (2006) defined TPACK as being competent with implementing technology to support pedagogical

methods with technology, assisting learners overcome the problems they face in the learning process, building upon current knowledge, and focusing on technology intending the maintenance of new knowledge. Niess (2008) also described TPACK as how teachers implement the technologies of the 21st century to plan, adjust and prepare class situations considering the needs of learners. Lastly, according to Timur and Taşar (2011), TPACK is the efficient integration of educational technologies with pedagogical content knowledge in the learning process. Considering all these definitions, the definition of TPACK can be concluded as a meaningful implementation of technology in the learning process and teachers' advancement of their pedagogical content knowledge with technology (Kozikoğlu & Babacan, 2019). With the use of the TPACK framework, technology, pedagogy, and knowledge help and create an inclusive learning process (Drajati, Tan, Haryati, Rochsantiningsih & Zainnuri, 2018).

The term was first abbreviated as TPCK, however, it was then transformed to TPACK because its pronunciation was easier and the emphasis of the integration of technology, pedagogy and content knowledge for efficient technology integration was greatly important (Thompson & Mishra, 2007). Later on, several teacher education programs were reconstructed with TPACK as a fundamental theoretical framework (Niess et al., 2006; Burns, 2007; Shoffner, 2007). In order to assess teachers' TPACK development, even some attempts were made (Koehler & Mishra, 2005).

Moreover, Drajati et al. (2018) stated that experimental studies of TPACK in the research field were provided which are linked with the professional development of teachers. Forssell (2011) noted that TPACK confidence is associated with the implementation of computers in the classroom by the educators. Even though, there existed a minor positive relationship between the recurrences of computer use; a more powerful relationship was discovered to the search of teachers' activities in class. The teachers possessing higher TPACK confidence were likely to implement a greater variety of activities that are connecting 21st-century skills with their learners. A further explanation of the TPACK framework is provided in the literature review and methodology chapters.

1.2 Statement of the Problem

Mahdum (2015) points out that in an era when technology was not prevalent and the teacher was considered a 'sage on the stage', in order to be recognized as a good teacher, it was enough only to be knowledgeable about pedagogy and content. The usage of these two components gave teachers a chance to build an effective teaching atmosphere. The arrival of technology and computers led people to begin collecting information through the Internet and online sources. Technology initially became one of the most crucial elements of people's lives and naturally, the effects of it were clearly seen in education and more specifically in English language classes. At that point, Information and Communication Technology (ICT), which is the digital processing and usage of information by the use of electronic computers became a great help in nearly all areas of learning and teaching (Akpabio & Ogiriki, 2017). Additionally, Computer-Assisted Language Learning (CALL), which is the language learning or teaching supported by computers, became an indispensable part of education. As time passed, mobile devices consisted of a big part of our lives in addition to computers. In this regard, the focus in technology integration into education has changed from CALL to Mobile-Assisted Language Learning (MALL).

As Koehler and Mishra (2008) pointed out in teaching through technology process, educators have a critical role. They mainly maintain the capability for suitable or unsuitable integration of technology in the teaching process. Furthermore, Alimirzaee and Ashraf (2016) stated that to create an effective teaching environment and learning experience between learners, educators must incorporate technology components into their pedagogical content knowledge (PCK). Therefore, language teachers must improve their teaching in effective ways and they need to figure out their knowledge type in order to integrate technology into the courses of study. More about this issue, Delen (2016) stated that the CALL and MALL became a crucial part of English language teachers' professional career. It is an undeniable fact that implementation of technology is highly necessary for EFL classes; therefore, content, pedagogy and technology knowledge should get together in the educators' professional careers (Koehler & Mishra, 2008). Efficient teaching is based on the combination of diverse types of knowledge and in this manner; the development of the TPACK knowledge of teachers to support an effective teaching environment for

the net generation learners is of great importance. However, the main problem in the educational technology field in language teaching is that whether the integration of technology into language teaching is actually being practiced and apart from implementing technology alone whether pedagogy, technology, and content knowledge are being integrated as a whole in the teachings of in-service EFL instructors. ICT use in classroom teaching and learning stays being a difficult task for a number of educators (So & Kim, 2009). Teachers do not consider themselves sufficiently ready for subject-specific use of ICT and a strong theoretical framework is required (Kramarski & Michalsky, 2010). At that point, as above-mentioned, the framework of TPACK is of great importance to address the challenges.

Additionally, it can be stated that most of the research on the implementation of technology in English language teaching education are aimed at learners and their processes of learning like the way technology affects their learning processes and also future (pre-service) teachers' knowledge development while they are getting informed about integrating technology into their teaching processes. There also exist numerous studies about detecting the TPACK level of in-service teachers and how it is related to some variables. Also, Solak and Çakir (2014) stated that various major fields were interested in the technological pedagogical content knowledge framework as every subject somehow has technological aspects. Some subjects, namely, mathematics and science have a great number of studies on this topic and there are also several studies in language teaching and TPACK. However, the TPACK studies in the Turkish context mostly addressed to the improvement of TPACK scales and justifying the reliability and validity of these scales instead of exploring the topic in detail. (Yurdakul et al, 2012; Öztürk & Horzum, 2011; Timur & Taşar, 2011; Sahin, 2011). Taking the literature that is reviewed in this study into consideration, it is also seen that there is a need to focus on especially in-service EFL instructors' TPACK level and the relationship of it with their informal technology use frequency because even if teachers use technology in their daily lives, they are not competent enough to integrate it into their teaching. There are 5.11 billion active mobile users according to Global Digital 2019 report and 4.39 billion internet users in the world today in 2019. Moreover, On average, Internet users of the world spend 6 hours and 42 minutes online daily. Even if these statistics indicate huge amounts of technology use, as mentioned earlier, this usage stays informally. Teachers do not

necessarily integrate their informal technology practices into their teaching and this is reported to be mostly resulting from their lack of teacher education. Therefore, so as to find a solution to this problem, it is aimed to see how we can contribute by doing the current research as we look for the relationship between informal technology use and TPACK levels of EFL instructors.

1.3 Purpose of the Study

Technology is a changing factor for both the way of learning and teaching. Effective implementation of technology requires the interaction of pedagogical, technological and content knowledge. Therefore, it can be concluded that technology is not enough to create an efficient learning and teaching environment by itself. It also requires effective comprehension and implementation of content and pedagogy by the educators (Dilworth et al., 2012).

As it is clearly seen, teachers have a highly crucial and critical role in the integration of technology in the classes for an effective education process. Additionally, their habits of informal technology use which mean the use of technology in their daily lives is a determinant factor for technology awareness. Thus, the current study has three primary objectives. The first one is to detect the TPACK level of in-service EFL instructors with the aim of identifying how competent they are with implementing technology efficiently in their teachings, the second one is to find out informal technology use frequency of in-service EFL instructors to know their habits of technology use, and the last is to analyze the predictive relationship between in-service EFL instructors' TPACK levels and their frequency of informal technology use in order to find out whether their frequency of informal technology use predicts how they implement technology in their teaching pedagogically to teach their content area.

1.4 Hypotheses/Research Questions

The purpose of this study is to find answers to the following research questions with the aim of detecting the predictive power of informal technology use frequency of in-service EFL instructors and their TPACK level. The research questions are:

1. What is the TPACK level of in-service EFL instructors?

2. What is the frequency of informal technology use of in-service EFL instructors?
3. Does the informal technology use frequency of in-service EFL instructors predict their TPACK level?

1.5 Significance of the Study

In the 21st century, the integration of technology in nearly all areas of language education is possible to be seen. The learners spend a lot of time with technological tools like computers and mobile phones after school (Tunçer, 2014). Technology should not be considered as a separate unit, instead, it should be considered as a fundamental part of teaching to develop the learning experiences of learners. Okojie et al. (2006) underline that it is highly essential for teachers to acknowledge whether the technological tools are suitable or not in terms of lesson aims, methods, and evaluation. In this manner, these tools turned into an ample element for learners and give a great opportunity for educators. The main goal for teachers is effective and efficient teaching. That is why, teachers want to deliver information with the most appropriate approaches, tools, and techniques. Also, the way they are seen by the learners might affect the motivation of learners when learning English (Bostan, 2018). At that point, the role of TPACK in teaching content and pedagogy with technology is highly important.

The development of the TPACK framework does not actually date back to very old times. After 2005, the TPACK framework came out and altered the direction of educational teaching approaches. Currently, as technology is seen in every part of our lives, this TPACK model turned into a crucial part of the educational methods and curriculum (Başer, 2015). Okojie et al. (2006) state that taking into the goals of their lesson consideration, teachers of today should care about the feasibility of technological tools. As technological tools are becoming crucial elements of students' lives, they provide a worthwhile opportunity for educators. Considering this opportunity, technological pedagogical content knowledge has a significant role in it.

This study aims to contribute to foreign language education, TPACK and use of technology studies in Turkey, broaden our knowledge on TPACK and lead to

improvements and adjustments in teacher education. Because, it is highly important for education planners and managers to make required adjustments in order to improve TPACK levels of teachers because teaching profession requires combining content, pedagogy, and technology in an effective way in the modern world. Furthermore, this study is unique for being one of the few studies that employ the comprehensive TPACK-EFL scale which is specifically designed for the English language field by Başer (2015) and has not been employed a lot for in-service EFL instructors in the literature. As a result, the present study addresses Turkish in-service English language instructors and it aims to find out the TPACK levels and informal technology uses of them.

1.6 Definitions

Information and Communication Technologies (ICTs): "a diverse set of technological tools and resources used to communicate, and to create, disseminate, store, and manage information" (Blurton, 1999).

Computer-Assisted Language Learning (CALL): "the use of computer software for learning languages" (Macmillan English Dictionary, 2002).

Mobile-Assisted Language Learning (MALL): It "exploits key mobile technologies for language learning such as pocket electronic dictionaries, personal digital assistants, mobile phones, MP3 players, and tablet PCs" (Zhao, 2005, p. 447).

EFL: English as a Foreign Language. English which is taught to students in a foreign, non-English speaking country.

Technological Pedagogical Content Knowledge (TPACK): "The basis of effective teaching with technology, requiring an understanding of the representation of concepts using technologies; pedagogical techniques that use technologies in constructive ways to teach content; knowledge of what makes concepts difficult or easy to learn and how technology can help redress some of the problems that students face; knowledge of students' prior knowledge and theories of epistemology; and knowledge of how technologies can be used to build on existing knowledge to develop new epistemologies or strengthen old ones" (Koehler & Mishra, 2009, p.66).

Formal Technology Use: Technology experience of teachers which happens inside school (Wang et. al., 2014).

Informal Technology Use: Technology experience of teachers which happens outside school (Wang et. al., 2014).



Chapter 2

Literature Review

This chapter supplies the framework of TPACK and its forms of knowledge, where the term derived from and how and to what extent it is related to English language teaching. Furthermore, it defines the knowledge forms of TPACK separately, namely, technology knowledge (TK), pedagogy knowledge (PK) and content knowledge (CK) and also the intersections of these knowledge forms, namely, TPK (technological pedagogical knowledge), TCK (technological content knowledge) and PCK (pedagogical content knowledge). Therefore, it gives information about TPACK studies, teacher development, and teacher education. Lastly, it mentions about technology in the context of education and English language teaching and its integration by the teachers.

2.1 Technology and Education

Technology is defined by Mishra and Koehler (2009) as all contemporary stuff becoming accessible and visible by people after being born. Additionally, Cox (2008) defines technology in two very different types namely, emerging technologies and transparent technologies. Emerging technologies are the new and digital technologies that are being used in the environments of learning. On the other hand, transparent technologies can be defined as the traditional course books, pencils and chalks being used in the classrooms.

Cüre and Özdener (2008) also state that we live in the century which is to be referred to as technological age. Our lives from all aspects get affected by the technology quick progress of technology. It would not be wrong to say that this effect can be felt in Z-generation individuals' learning styles, and as a consequence, in their education systems. Resulting from these considerations, the implementation of technology in education is a must. Also, because of the impacts of technology in the education system, expected responsibilities and duties from teachers have altered. It cannot be said that this expectation is solely the teachers' integration of technology; on the contrary, it is the effective implementation of technology in teaching.

Warschauer and Healey (1998) say that since the 1960s, the use of computers has existed and there are a number of studies proposing that experimentation with digital and technology tools is still needed in language learning and education. Resulting from the pace of technology, in the fields where technology is considered as an instrument, there have been radical alterations (Polat, 2017).

Başal (2015) clearly states that people's lives are currently altering and how they live is shifting with the effect of rapid improvements in technology. In line with these developments, technology integration in education has been increasing and also language education has been affected to some extent.

Eady and Lockyer (2013) additionally argued that technology has always been very important in the learning and teaching environment. It has always been the profession of teachers' most necessary part as they can integrate it in order to promote the students learning cycle. Speaking of technology in education, encountering the word 'integration' is not a surprise. Accepting the reality that technology has a big role in our daily lives, we also need to consider the idea of including technology in the curriculum and make plans using technology in order to reinforce the learning process. To recap, technology happens to be an essential part of learning and a highly crucial issue for teachers.

Moreover, Solanki and Shyamlee (2012) and Pourhosein Gilakjani (2017) argue that resulting from technology, the language teaching method has been changed. They also think that technology integration gives a chance to learners to learn in line with their interests and requirements. Technology pleases the auditory and visual senses of learners to some extent. According to Lam and Lawrence (2002) and Gilakjani (2017), technology is the key element for helping learners adapt their own learning process, they can even easily reach a great deal of information which their teachers cannot support.

2.1.1 Information and communication technology (ICT). ICT term can be defined as the electronic resources that are used to create, process, supply, demonstrate, share and transfer information. Therefore, in general context, ICT includes technologies like television, video, radio, DVD, telephone, satellite systems, computer and network hardware and software, and all supplies and utilities related to

these technologies like blogs, e-mail and videoconferencing (UNESCO, 2007). When considered in the educational context, ICT can be defined in a narrow scope and contain only computer and computer-based technologies such as tablets, smartphones, laptops and software, and internet-based technologies involving websites, email, blogs, and social networking sites like YouTube used to aid learning and teaching process. In the field, there have been several studies examining the benefits of ICT for teachers and learners when integrated accurately. Cowie and Jones (2009) argued that ICT can develop educational aims like knowledge choice, collaboration, production, and reflection. Moreover, Uluyol and Şahin (2014) said that ICT use can make “lessons more interesting, more enjoyable for both teachers and students, more diverse, more motivating and more supportive of productive learning” (p. 67). Therefore, the role of ICT in language teaching and learning cannot be denied (Akpabio & Ogiriki, 2017). ICT fosters interactive teaching and it enhances creativity besides attracting to all learning styles. It is also a great opportunity for learners to work individually and take responsibility for their own language learning. To sum up, The above-mentioned opportunities of ICT have made ICT an important part of education and a necessary element of the curriculum as well (Papanastasiou & Angeli, 2008).

2.1.2 CALL. Computer-assisted language learning (CALL) includes technology use that appears in the form of computers and a process of a complete change in the institution where it is actually being implemented. With the invention of computers, CALL has been in use and a point of focus (Nunan & Carter, 2001). Therefore, CALL turned into an essential part of the language learning process and the effects of it appear in every part of education. Levy (1997) described CALL as “the search for and study of application on the computer in language teaching and learning” (p.1). Furthermore, CALL is defined by Schofield (1995) in simple terms as an activity of language learning or teaching carried out with computers. Therefore, it is an undeniable fact that the knowledge of teachers about CALL is a highly significant issue and developing their knowledge about CALL instead of digital literacy is more crucial for the effective implementation of technology. Following the improvements that CALL has proposed in time, Uzunboyly, Biçen, and Çavuş (2011) state that these technological improvements affect the methods and techniques of English language teachers. As a result of the opportunities proposed by

CALL, the learners and teachers of EFL begin to alter the methods that they administer in and out of the classroom. For example, teachers have the chance to manage classes through Skype and similar applications; they have the opportunity to reach their learners through e-mail and messenger programs; moreover, they can even come together in the virtual world regardless of different cities or countries they live in (Chapelle, 2010). However, the invention of mobile devices which are in our daily lives began to change the focus from computer-assisted language learning (CALL) to mobile-assisted language learning (MALL).

2.1.3 MALL. Colpaert (2004) viewed that during the whole record of CALL, amateur production stages preceded professional development stages, and he thought if “the mobile hype will burst out as soon as tools become available allowing teachers and researchers to develop their own mobile applications and tools.” or not (p.262). The hype which Colpart referred to, of the advance of mobile-assisted language learning (MALL), is currently an irreplaceable part of our lives as it is seen in the hands of learners and teachers. Chinnery (2006) stated that MALL would make the language learning process more informal and personal with the learners practicing and studying feasible information chunks anywhere on their personal time. With the help of mobile phones, we possess the chance to support a meaningful environment for our learners (Stockwell, 2010). Keegan (2003) also believed that mobile learning would form the upcoming of learning. Currently, it is not surprising to see millions of people learning a language with the help of mobile applications like Busuu and Duolingo. (Rosell-Aguilar, 2018)

2.2 Technology and ELT

In today's modern world, integrating technology into EFL classes is of great importance and is preferred more than ever before. There are thousands of online sources available for both learners and teachers. It is possible for learners to chat with native speakers, listen to online broadcasts, and watch English movies and series, access to online tools in order to improve their level of English. It can be said that, when we compare language education to other fields in social sciences, technology use needs to be used more in it (Kartal, 2005). Also, language education required the common use of modern technology a lot (Golonka et al., 2014). The advances in technology have affected the way teachers teach. If used properly,

technology can motivate the students with more personalized activities (Erben, 2013).

As it is relatively rare to be exposed to a natural English speaking environment and there are not so many conveniences of authentic communications and interactions with native speakers of English, so as to learn authentic English, particularly the skills of speaking and listening, English language learners mostly depend on technology. Even in the past, learning English was based on early technological tools. Yang (2000) states that in the 1960s, in order to learn spoken English, vinyl records and then tape-recorders were necessary and big needs. It is possible to state that technology development makes spoken English accessible and available in a non-English speaking setting. Therefore, the integration of technological tools and being competent in them must be an element of EFL teachers' professional knowledge of teaching (Liu et al., 2014).

Patel (2013) also says that English teaching methods have altered a lot because of the integration of technology. It has a number of opportunities like making the teaching process compelling and more creative. In the traditional way of teaching, teachers have active roles in the classroom; they stand in front of the students and give a lecture, instructions with the help of whiteboard. With the advancement of technology, this kind of teaching has changed. The integration of multimedia made it possible for learners to improve their linguistic knowledge, become familiar with vocabulary and language structures. Arifah (2014) adds that internet use assists learners to search for information and presents various materials to analyze and interpret language and texts.

The use of technology builds a learning atmosphere that is centered on the learner, not the teacher bringing out positive alterations (Dawson, Cavanaugh, and Ritzhaupt, 2008 and Gilakjani, 2014). They also pointed out that any language class is an active place involving reasonable tasks where the students take on responsibility for their own learning with computer technology use.

Drayton et al. (2010) stated that the responsibilities of learners are improved by a real learning experience which is supported by the use of computer technology. Technology gives a chance to students to learn any subject independently and they

become more responsible for their own actions which can also be referred to as self-direction.

According to Arifah (2014), the motivation of students is increased with the integration of technology in classes. For instance, integrating the activity of watching movies into teaching assists learners to show more interest in the comprehension of the topic. And also, the process of learning becomes more meaningful with the integration of technology through computer and internet. What is more, learners' high order thinking skills are also developed with the use of technology. To sum up, the appropriate combination of technology and teaching methodology is of great importance to draw learners' attention to English language learning.

2.3 Teachers' Use of Technology

Harris and Hofer (2010) stated that digitalization has affected the technology of today a lot and now it is an outstanding factor for education. On the other hand, it is not even open to discussion for EFL teachers whether to implement it or not, instead, the important thing to consider is how well they can use it. Mishra, Koehler and Kereluik (2009) add that if teachers cannot be successful with following the latest technology in education, it is inevitable that they will not be able to teach effectively.

Liu et al. (2014) argue that, upon the arrival of the Internet, it became a motivation which is encouraging teachers to be experts at the integration of technology. Chapelle (2009) clearly emphasizes that integrating technology into classes specifically in EFL classes in a non-English speaking environment determines the efficiency of the learning and teaching process a lot. It is by far more effective and encouraging compared to traditional methods and it definitely draws the attention of learners to the class easily as it is very outdated to teach with traditional methods.

Başal (2015) emphasizes that it is highly crucial for language teachers to be holding the essential information and competency to implement technology in their classes efficiently. At that point, ACTFL (as cited in Başal, 2012) also claims that a language teacher's qualification highly determines the use of technology into the language learning processes and “our human capacity as teachers to plan, design, and

implement effective educational activity” Warschauer & Meskill (as cited in Başal, 2000, p. 316). Considering all these, the issue of educating teachers accordingly has become a great issue in education.

Kaya and Yılayaz (2013) also argue that there are several competencies which are expected from Turkish EFL teachers. These expectations are; using technology in the classes effectively, inspiring learners to learn English with the help of technology, motivating learners to use English and developing the students' four main skills, namely, reading, writing, listening and speaking. In order to meet these expectations, the teachers must alter the way they teach and the techniques and methods that they use. In the era of information and technology, teachers have to keep up with technological improvements for an improved community, prosperous education and implement technology in order to provide efficient learning of students. More specifically, it is highly crucial for teachers to have essential technological, pedagogical and content knowledge skills and develop these skills of theirs continually in their professional lives.

2.4 Barriers to Technology Use

As mentioned above, teachers' integration of technology into the classroom is highly important. However, even if teachers use technology informally in their personal lives, they may have significant drawbacks in the effective implementation of computer technology in their teachings. Actually, there are a lot of barriers that EFL teachers are facing to integrate computer technology into their education. These barriers can be classified as the accessibility of hardware and software, poverty of computer intelligence, abundance of computer mastery, insufficient computer technology facilitation, time factor, teacher perspectives, and poverty of professional progress in computer technology integration (Gilakjani et al., 2015). Furthermore, Groff and Mouza (2008) explored six crucial factors with sub-factors reviewing literature surrounding technology adoption and capability of teachers to the effective application of innovative tools in classroom teaching. "They are i. Legislative factors ii. District/school-level factors iii. Factors associated with the teacher, iv. Factors associated with the technology-enhanced project, v. Factors associated with the students, and vi. Factors inherent to the technology itself" (Singh, 2019, p. 3). Hew and Brush (2007) arranged these factors as first and second-order barriers. First-order

barriers to technology integration are defined as being extrinsic to teachers and contain lack of technical equipment, insufficient time, and classroom assistance and second-order barriers are intrinsic to teachers and include poverty of relevance, discrepancy with classroom management style, and dearth of assurance are challenges of technology integration for teachers (Ertmer, Addison, Lane, Ross & Woods, 1999). Furthermore, they indicate that second-order barriers are more of a serious issue than first-order barriers.

Inadequate teacher training can be considered as the most detrimental effect on preventing teachers from integrating technology (Bauer & Kenton, 2005; Yang, 2008). In a research study conducted by Yang (2008), the displayed outcome was that resulting from the dearth of information technology experts, 46.3 per cent of the 378 teachers said they had not experienced any professional development in the integration of computer technology. The form of training teachers are given is critical. Professional development must focus on content and be cooperative so, this will certainly change teachers' teaching techniques and contribute to students' learning (Li & Protacio, 2010; Shi & Bichelmeyer, 2007; Wei, Darling-Hammond, Andree, Richardson & Orphanos, 2009). When sufficient importance is given to specific content areas or instruction methods, teachers will benefit more information from professional development and use it with their teaching techniques.

The results gathered from the previously-mentioned research studies demonstrate that for building up positive manners regarding computer technology between teachers, adhering to what teachers understand from computer technology and its practicality in their teaching, what their knowledge and skills are or what skills they are required to improve more are highly crucial. Since teachers have more positive attitudes towards computer technology, it is therefore clear that they prefer to incorporate it more into their teaching in the classroom.

2.5 Professional Development of Teachers

Kelly (2006) defines teacher learning as the process of developing knowledge of teachers throughout time and this kind of learning takes place in a complicated organization and gets affected by many significant factors. Professional development supports teachers' skills and information in order to improve their teaching styles and

methods and to enlighten them more about their perceptions of student learning. Century et al. (2010) and Rogers et al. (2007) argue that while professional development is considered as only specific teacher training sessions, professional learning otherwise involves "multiple experiences of ongoing modification to conceptual, practical and philosophical stance through a multiplicity of contexts" (as cited in Lee, Longhurst & Campbell, 2017, p.4).

Li (2018, April) argues that as the higher education is developing promptly, how it is important to have high-quality teaching staff is understood by everyone. Teacher development involves continued advances and improvement of personal and professional traits. In also English teaching, it is of great importance and essential to have a qualified teacher team to improve English teaching in higher schools. Li also adds that:

A good teacher should be a smart teacher with the wisdom to learn, to live and to educate, who can help and guide students in all aspects. The development of modern information technology has made online teaching and smart classroom possible, and meanwhile, put forward higher requirements for teachers' abilities and qualities. This has brought both opportunities and challenges for the development of English teachers' professional careers (p.377).

Doering et al. (2009) said that there exist various studies in order to explore the TPACK development in accordance with the research studies forming the base of TPACK explanation and evaluation. In these studies, there was one common goal which was to find out the impacts of professional development on teachers' development of TPACK. It was clearly discovered that professional development programs have beneficial effects on teachers' TPACK development (Doering et. al., 2009). The most inclusive study which was about determining TPACK in relation to teacher professional development was implemented by Wilson and Wright (2010). Their research study was about two social studies teachers' TPACK development for some time which included pre-service to in-service teaching.

2.6 Teacher Education in Educational Technology

Başal (2015) states that as the world changes, the expectations from language teachers have also been changing. In also other fields, it is expected from teachers to integrate technology into their classes favorably like language teachers. It is not even wrong to say, language teaching requires the most use of technology in classes. Therefore, English language teachers need to be competent enough to follow the latest trends in technology and implement them into their lessons reasonably by considering the learners' needs, levels, etc. Because using technology directly affects the English teaching process and it even shapes how English is taught and how learners learn. Considering this issue, it is undeniable to support the idea that English language teachers' technological competence level is required to be improved relatively.

It is highly crucial to improve English language teachers' technology knowledge and competences before they become in-service teachers. Therefore, it is obvious that the best and most important time to develop teachers' technology knowledge and skills is teachers training programs, namely, pre-service teacher education.

Çetin-Berber and Erdem (2015) state that in agreement with the alterations in standards, the content of teacher education programs has altered through integrating technology. In the previous models of these programs, the components of training in technology and the rest of teacher education program were not very related as content methods lessons and computer literacy lessons were independent from each other and rarely interconnected in real cooperation on the way teachers would be able to integrate technology into authentic learning environments.

Zhang and Martinovic (2008) say that information and communication technologies (ICT) are gradually accepted in communities and also have reached schools. As it has gone through a number of developments, it is a need for teachers to have enough information about these broadcasts and the effects on the achievement of learners. The term ICT does not have a certain definition because technologies develop constantly. Yet, the National (US) Higher Education ICT Initiative (2003) defines ICT competence in the tertiary level education context as:

The ability to use digital technology, communication tools, and/or networks appropriately to solve information problems in order to function in an information society. This includes the ability to use technology as a tool to research, organize, evaluate, and communicate information and the possession of a fundamental understanding of the ethical/legal issues surrounding the access and use of information (p. 11).

Haddad (2003) indicates that ICT has the capability to transform how teachers teach and it is very beneficial with more student-centered methods and improving the higher-order skills and advancing collaborative activities. Moreover, Collis & Jung (2003) say that teachers have the tendency of integrating ICT into classes if they have experience with ICT skills as a learner. That is why acknowledging the importance of ICT in learning and teaching is of great importance. Several countries provide ICT teacher training and include ICT lessons in higher education for pre-service teachers. Even though some educators state that they have not had enough input and training to integrate technology efficiently in class, there are several attempts and efforts around the world to train teachers to integrate technology efficiently in order to assist the teaching and learning process (Jung, 2005).

2.7 The framework of Technological Pedagogical Content Knowledge

The framework of TPACK was studied broadly in a number of studies. First, this framework has derived from Shulman's definitions of PCK (Pedagogical Content Knowledge) (1986) to define the understanding of educational technologies of teachers and PCK to cooperate with each other producing practical teaching along with technology. Shulman (1986) pointed out that teachers needed to establish a brand new knowledge basis coming from content and pedagogy relationship. Shulman (1986) also pointed out that PCK "represents the blending of content and pedagogy into an understanding of how particular topics, problems, or issues are organized, represented, and adapted to diverse interests and abilities of learners, and presented for instruction" (p. 8). Following the approach of pedagogy and content interaction, educators needed to implement a brand new item to the common PCK design in order to describe a new knowledge basis which depends on technology. The findings of Pierson's study propose the 'technological knowledge' component to the model (2001). Pierson (2001) stated that "This knowledge would include not only

basic technology competency but also an understanding of the unique characteristics of particular types of technologies that would lend themselves to particular aspects of the teaching and learning processes" (p.427). For her, a teacher integrating technology effectively would certainly be able to make use of comprehensive content knowledge and pedagogical knowledge cooperatively with technological knowledge. Additionally, the term TPACK referring to technology-enhanced PCK has been used by Niess (2005). In her study, she explored pre-service teachers' pedagogical content knowledge development about integrating technology. She also believed that teachers' competence in the subject area is integrated with ability in technology and pointed out the technology could be considered as a center in order to teach the subject.

Following the studies of Niess, Mishra and Koehler (2006) have come up with a framework to describe teachers' knowledge which is required to get in order to integrate technology into the process of teaching and learning efficiently. Pamuk (2012) points out that Mishra and Koehler embedded the technology component into Shulman's PCK model to define the connection between other components and technology then their model is to be called TPACK. Technological pedagogical content knowledge is described by Mishra and Koehler (2006) as "an understanding of the representation of concepts using technologies; pedagogical techniques that use technologies in constructive ways to teach content; knowledge of what makes concepts difficult or easy to learn and how technology can help redress some of the problems that students face; knowledge of students' prior knowledge and theories of epistemology; and knowledge of how technologies can be used to build on existing knowledge and to develop new epistemologies or strengthen old ones" (p. 1029)

Even though Koehler, Mishra, and other scholars have made descriptions and measurements of TPACK, it is hard to say that the framework is interpreted appropriately and completely (Angeli & Valanides, 2009). Therefore, Angeli and Valanides (2009) developed the ICT-TPACK model. They basically established their model using the TPACK framework as a base. Additionally, the ICT-TPACK of the crossing points of content, learners, context, and ICT components are shaped by this progressive designed pedagogy approach.

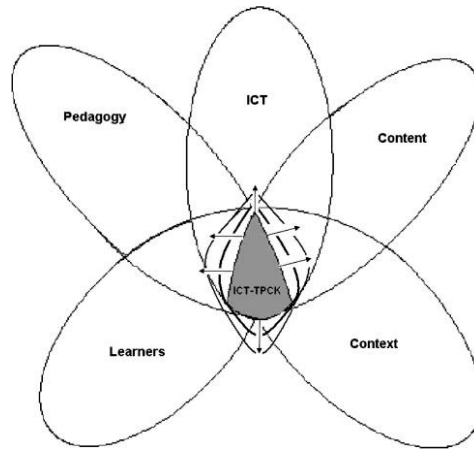


Figure 1. ICT-TPCK. (Angeli & Valanides, 2009, p.159).

One of the contributions to the TPACK framework is made by Lee and Tsai (2010). Their aim was to establish a new questionnaire which is called the technological pedagogical content knowledge-Web (TPCK-W) in order to find out teachers' self-efficacy concerning their TPCK-W. Lee & Tsai (2010) indicate in their study that TPCK-W has many uses like progressing current tools in order to assess teachers' self-efficacy specifically regarding TPCK-W. Moreover, they add that teachers' self-efficacy information regarding their TPCK-W may be able to tell how teacher education can be developed and build up teachers' professional development.

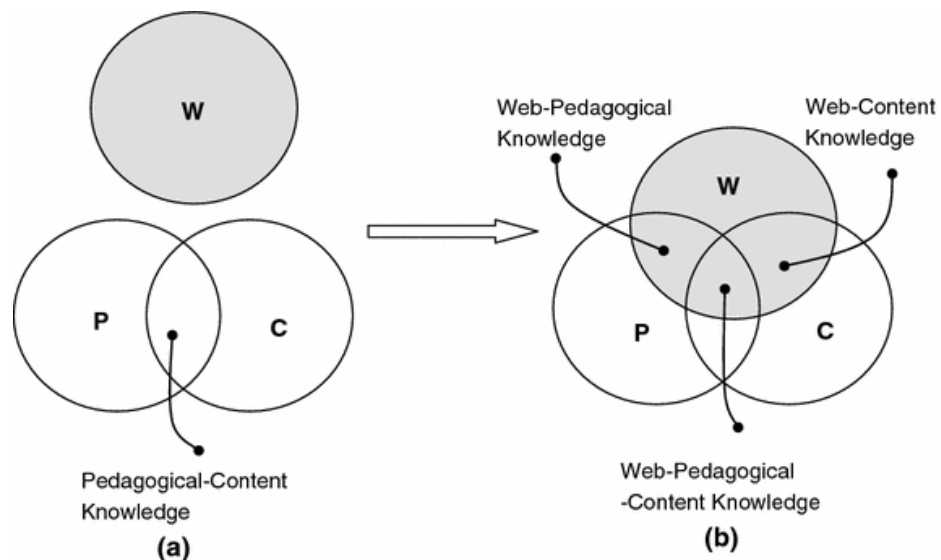


Figure 2. The framework of Technological Pedagogical Content Knowledge-Web (Lee & Tsai, 2010, p.4)

As a consequence, in the framework of TPACK part, four studies and contributions to the field are introduced. The first one is Niess's technology-enhanced

PCK which she considered technology as a center and integrated teachers' competence in the subject area with their ability in technology. Second is Angeli & Valanides's ICT-TPCK which they took TPCK "as a unique and distinct body of knowledge" (2005), and the third one is the technological pedagogical content knowledge-Web (TPCK-W) by Lee & Tsai which aimed to integrate web technology into teachers' pedagogical practice. The last one is Koehler and Mishra's TPCK which they added the component of technology into Shulman's PCK to present the connection between technology and the other components.

2.7.1 Components of technological pedagogical content knowledge

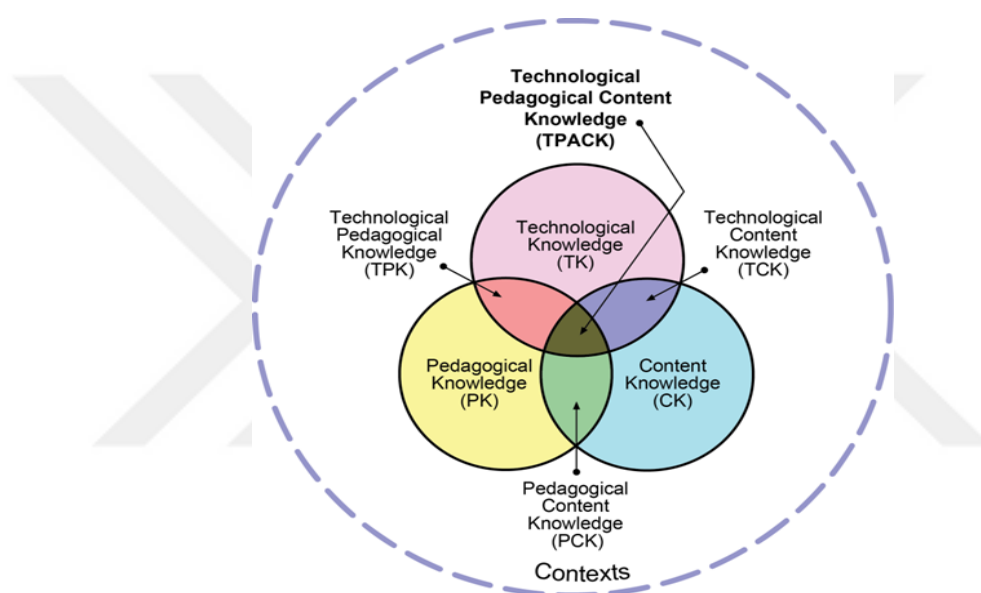


Figure 3. The TPACK framework and its knowledge components (Koehler & Mishra, 2009, p.63).

The improvement of TPACK by teachers is of great importance to practical teaching with technology. Three knowledge fields are recognized within the framework of TPACK, namely, technological knowledge (TK), pedagogical knowledge (PK), and content knowledge (CK). The TPACK framework proceeds ahead by giving priority to the forms of knowledge that lie at the crossings between three primary forms: technological content knowledge (TCK), technological pedagogical knowledge (TPK), pedagogical content knowledge (PCK), and technological pedagogical content knowledge (TPACK). Teachers integrate TPACK into their teachings by combining content, technology and pedagogy knowledge at the very same time. The cases of using the three forms of TPACK are introduced to

the teachers exclusively; therefore, each teacher, each course or each perspective to teach cannot be based on only one technological explanation (Koehler and Mishra, 2009).

2.7.1.1 Content knowledge (CK). The knowledge of teachers about the learned or taught subject is to be called content knowledge (CK). It is defined as "understanding of the major facts and concepts in a discipline as well as the substantive and syntactic structures of that field" (Cox, 2008, p. 7). Content knowledge is of great value and importance for teachers. Shulman (1986) indicates that content knowledge consists of notions, methods, opinions, organizational frameworks, indication and clue and also rooted processes and concepts to promote such knowledge. Koehler and Mishra (2008) argue that teachers' comprehensive content knowledge poverty is such a limiting and contradictory condition because learners acquire inaccuracy and build misunderstanding. Moreover, Mishne (2012) concludes that content knowledge can also be implemented by teachers for real-life practices with the condition that they apprehend the study field and consider inside its restraints.

2.7.1.2 Technology knowledge (TK). Technology knowledge is defined by technology literacy of the national research council (NRC, 1999) as the fluency of information technology (FITness). In accordance with this definition, this knowledge requires the capability to comprehend the information technology widely, use it in their daily lives and fit to the innovations in information technology (as cited in Koehler & Mishra, 2008, p.15). Additionally, FITness necessitates a more detailed, more necessary accepting and expertise in information technology for information development, transmission and analytical than does the usual explanation of computer literacy. By adopting the technology knowledge term regarding this definition, an individual may accomplish a number of different tasks using information technology and supporting different ways of fulfilling a given task (Koehler and Mishra, 2009). Furthermore, technology knowledge involves intelligence and competencies of both non-electronic tools, like books and boards, and digital technologies (Mishra & Koehler, 2006; Schmidt et al., 2009; Shin et al., 2009).

2.7.1.3 Pedagogical knowledge (PK). The term of pedagogy is mainly described as the comprehensive knowledge of teachers about learning and teaching methods, knowledge and processes including teaching styles, feedback and assessment, and teaching theory. It encompasses all of educational goals and purposes. Koehler and Mishra (2005b) point out that pedagogical knowledge signifies the knowledge and skills supporting the teaching career and it also involves planning skills, organizing and grading and relates to teaching correspondingly with learning styles of learners. It is of great importance for teachers to recognize their students' abilities, interests and learning styles to choose appropriate methods and teach accordingly which will lead to effective learning. Additionally, Morine-Dersheimer and Kent (1999) argue that personal assumptions, feasible knowledge, and reflection are also the main components of forming pedagogical knowledge. Shulman (1987) indicated that extensive standards and approaches of classroom management which seem to transform themes are included in common pedagogical knowledge.

2.7.1.4 Pedagogical content knowledge (PCK). PCK is described as a formation of a new knowledge basis using two or more independent knowledge bases as the heart of the best teaching and comprehensive groundwork of the TPACK model (Pamuk, 2012). One other definition of PCK can be concluded as the knowledge of teachers about how to teach the target language in order to enable learners for interaction across lingual and cultural boundaries by (Van Olphen, 2008). Shulman (1987) argues that pedagogical content knowledge components can be considered as the instructional plans of learners' learning problems. Additionally, Shulman (1986) emphasizes that pedagogical knowledge and content knowledge must be taken into account as items which require integration instead of going up against in teacher training programs, by doing it so, it is possible to train more competent teachers. Shulman (1986-1987) pointed out that the PCK or in other words the teachers' knowledge comprised seven categories. These seven categories are listed as follows:

- i. General pedagogical knowledge,
- ii. Private content knowledge,
- iii. Program knowledge,

- iv. Knowledge of learning difficulties and characteristics of students,
- v. Educational objectives, values and historical, philosophical foundations of education,
- vi. Learning environment knowledge,
- vii. Pedagogical content knowledge.

2.7.1.5 Technological pedagogical knowledge (TPK). It is highly crucial for educators to develop themselves continually. Their pedagogical knowledge is not adequate itself; it needs to be supported with technological knowledge to keep up with the latest developments and trends in education. Harris et al. (2009) define technological pedagogical knowledge (TPK) as the intelligence of the integration of certain technologies in the teaching process and the way learning and teaching evolve. Additionally, Çoklar et al. (2007) define technological pedagogical knowledge as the knowledge of how teachers are able to use their technological knowledge in a pedagogically purposeful approach in in-class exercises and how they are able to evaluate the results of these exercises. In order to integrate technology into the classroom, teachers need to evaluate, examine and design these technologies. Moreover, Mishra and Koehler (2006) point out clearly that teachers shape the materials that they use in their classes by considering the profile and needs of every student groups. Basically, TPK is the knowledge about the transformation of learning and teaching when technologies are integrated and also it is mostly shaped by the teachers' creativity. There are several technological tools available, yet, it is the teachers' duty to adapt them for pedagogical purposes. Therefore, it can be said that TPK requires teachers to be broad-minded, innovative and idealistic, so, they will have no problems with integrating technology in their lessons which will affect the learning process in a positive way for both teachers and learners.

2.7.1.6 Technological content knowledge (TCK). Technological content knowledge (TCK) is described as the teachers' compatibility to perceive and evaluate technologies in any subject field (Mishra and Koehler 2006; Koehler, Mishra and Yahya, 2007). It can also be said for TCK that it is a kind of information emerging from the relationship of technology and content and affected by each other in both the technology and content field. It is the teachers' duty to form the subject field by considering the use of technology besides the subject field they are supposed to teach

(Mishra and Koehler, 2006). Moreover, the teachers' earlier experiences and knowledge lead them to decide on detecting the best and most appropriate ways of teaching regularly. Mishne (2012) states that as the teachers are competent with technology, they are proficient in selecting the appropriate technological tools to help learners to understand the subject better. The improvement of TCK depends on teachers' need to understand that:

- a. Present technologies are supported by the contemporary technologies or new uses that are shaped by content while content is shaped by opportunities and restrictions of technologies.
- b. The effect of technology on human acknowledgment is deniable.
- c. The changes in technology propose new views in order to comprehend human acknowledgment (Harris, Mishra & Koehler, 2009).

2.7.1.7 Technological pedagogical content knowledge (TPACK). It is of great importance what to teach meaning content, how to teach meaning pedagogy and additionally which materials to implement when you teach meaning technology (Koehler and Mishra, 2008). Technological pedagogical content knowledge (TPACK) is considered to be a framework which is formed to describe educators' competence to implement technology in the subject field and curriculum (Bostancıoğlu & Handley, 2018). Also, in this framework, it is obvious that content-based educational technologies need to be pedagogically sound (Ferdig, 2006). The interaction between the three components of TPACK is specifically highlighted by Mishra and Koehler (2006). They also pointed out that;

Successful teaching with technology is a multi-dimensional process that requires understanding the representation and formulation of concepts using technologies; pedagogical techniques that utilize technologies in constructive ways to teach content; knowledge of what makes concepts difficult or easy to learn and how technology can help address these issues; knowledge of students' prior knowledge and theories of epistemology; and an understanding of how technologies can be utilized to build on existing knowledge and to develop new or strengthen old epistemologies (Koehler et al., 2007, p. 743).

TPACK mainly allows teachers to decide a fit between the focus of the content, pedagogical approaches and educational technologies. Technology integration has become an undeniable part of lessons, and since then the importance of teachers' development of TPACK has increased to some extent (İşler & Yıldırım, 2018).

2.7.2 Studies on TPACK

There have been several studies conducted in the literature to support the development of TPACK. There are studies in different subjects like Mathematics, Science, Social Sciences and English. Additionally, there are research studies specifically focusing on only pre-service teachers or in-service teachers. By looking at the studies, it can be clearly seen that there are relatively more research studies with pre-service teachers rather than in-service teachers. Moreover, the most common subjects that are studied with TPACK are mathematics and science. The number of TPACK studies with a focus on English language learning and teaching is relatively fewer in number.

Firstly, Tai and Chuang (2012) introduced a 'TPACK-in-Action model' with the aim of helping in-service English teachers to implement technology in language classrooms in Taiwan. In order to develop in-service English teachers' TPACK competency in five steps as (i) modeling, (ii) analysis, (iii) demonstration, (iv) application, (v) reflection, they planned a computer-assisted language learning (CALL) workshop. With the help of this programme, in-service English teachers were able to learn how to teach by using pedagogically assessed technology. What is more, they could deliver their workshop experiences to their teaching processes in classrooms. Additionally, Ansyari (2012) developed a professional development program for technology implementation by doing a design-based research. 12 English language instructors were study participants. The results revealed that all participants accepted that the TPACK professional development services provided positive experiences, and some vulnerabilities relating to time, technology development and student participation were also discovered.

Koh and Sing (2011) also conducted a study on the Taiwanese pre-service teachers' perceptions by considering age, gender and seven components of TPACK.

The research results showed that TPACK components had persuasive effects on pre-service teachers' views of TPACK; nevertheless, the age and gender influences played no significant role. Additionally, between the components of TPACK, TPK and TCK were the determinants.

As a contribution to the fields of mathematics and science, Jang and Tsai (2012) studied the Taiwanese elementary level mathematics and science teachers' TPACK regarding the use of interactive whiteboards (IWBs). Their study clearly showed that teachers who used IWBs had a higher level of TPACK. One other point was that science teachers were significantly more proficient in TPACK than mathematics teachers. The study did not reveal any difference in TPACK respecting gender. Nevertheless, it was found that the TPACK levels of more experienced teachers were higher than those of less experienced teachers for years.

In order to measure in-service teachers' confidence related to four TPACK components that include technology (TK, TPK, TCK, and TPACK), Graham et al. (2009) developed a pre-post questionnaire. He supported his decision with the idea that TPACK was an expansion of PCK, TPK was an expansion of PK, and TCK was an expansion of CK. Their survey which consisted of thirty-one items and two open-ended questions was given to fifteen in-service teachers who attended in a professional development program. Eleven of the fifteen participants were primary school teachers, 10 of them were females and 1 male; four participants were high school teachers 1 of them was female and 3 male. The results of the study indicated that there existed a noteworthy advancement in teachers' TPACK for all four components. While their level of beliefs in themselves was highest in TK, it was lowest in TCK.

In Turkey, Koçoğlu (2009) conducted a study with twenty-seven pre-service English language teachers studying a four-year undergraduate program at the department of foreign language education in a Turkish university. The main purpose of the study was to evaluate technological pedagogical content knowledge (TPACK) from pre-service EFL teachers' perspectives. The results of the study indicated that computer-assisted language learning (CALL) courses were agreed to be beneficial with developing pre-service teachers' TPACK.

One of the biggest contributions to the EFL field is made by Başer (2015). The researcher contributed to TPACK studies with the development of the TPACK-EFL survey. The purpose of the study was to develop a TPACK evaluation tool that was designed to determine pre-service English language teachers' TPACK levels. Besides the development of this evaluation tool, during the process of the improvement of this tool and validation process, a number of lessons have been learned. Through exploratory mixed methods with instrument development model (Creswell & Plano Clark, 2007) following mixed methods, particular knowledge and skills needed for efficient technology implementation into English language teaching within the TPACK framework were investigated. The main aim of the investigation was to develop a more specified TPACK survey, namely, TPACK-EFL. The survey was conducted on pre-service EFL teachers, "eventually, the study aimed to provide evidence 5 for validity and reliability of this specified TPACK survey, namely the TPACK-EFL survey, through three rounds of evaluation." (Başer, 2015, p. 5).

When we mention the studies which used TPACK-EFL survey, two examples can be given. Firstly, in order to investigate the attitudes of English language instructors' TPACK in teaching EFL context, Köse (2016) conducted a study with 127 in-service English language instructors from various government universities in Turkey. The TPACK-EFL survey was also used for data collection and as the results of the research study indicated EFL instructors felt the most efficient in their subject matter. Nevertheless, they did not believe that they integrated technology and sound pedagogy into their content teaching.

Secondly, Sarıçoban et al. (2019) measured the TPACK level of pre-service EFL teachers that are being educated to teach English as a foreign language by using the TPACK-EFL survey. The participants of the research study were 77 pre-service EFL teachers. The findings displayed that pre-service EFL teachers had a satisfying level of competency in technological pedagogical content knowledge; yet, there were also some fields in which they required improvement.

Apart from the TPACK-EFL survey, there also exists a TPACK-Deep survey and it was developed by Yurdakul et al. (2011). They stated that the results of their TPACK-Deep survey showed that the teachers' competency levels in TPACK were average and also there was no significant difference between the teachers' gender, workplace, experience, how much time they have spent on computers or the Internet

and their TPACK. However, teachers whose years of experience were five years or less and the ones working in private schools had a relatively higher level of TPACK when compared to the ones working in government schools.

Moving on to the other subject field that is studied with TPACK in Turkey, the study of Özgen et al. (2013) can be given as an example in which they studied mathematics teacher trainees' technological pedagogical content knowledge (TPACK) levels and the effects of their perception of technology use frequency on TPACK. 340 teacher trainees studying at primary and secondary mathematics teacher education departments were the participants of the study. The data collection tools were the TPACK scale and a personal information questionnaire. The results of the study showed that teacher trainees' TPACK scores varied somewhat respecting their perception of the frequency of technology use. Also, it was discovered that teacher trainees possessing a positive perception of the frequency of technology implementation had a higher level of TK, TPK, TCK, and TPACK when compared to other teacher trainees.

Moreover, Öz (2015) assessed 76 pre-service English as a foreign language teachers' technological pedagogical content knowledge (TPACK). The participants were asked to answer the technological pedagogical content knowledge scale anonymously (Schmidt et al., 2009) and also answer some open-ended questions. The findings of the study displayed a well developed TPACK knowledge. Considering the gender dissimilarities, females were detected to have higher TPACK development regarding technological knowledge (TK) and pedagogical knowledge (PK) competencies. Qualitative data analysis also revealed that faculty members in the department used more TPACK in their courses when compared to cooperating teachers. Öz proposed that integrating technological pedagogical content knowledge (TPACK) into the current teacher education program and providing a technologically rich environment could contribute to the quality of learning and teaching for language learners and also the other studies in the field that are mentioned earlier share the same conclusion with Öz.

Additionally, İşler and Yıldırım (2018) investigated Turkish pre-service EFL teachers' perceptions relating with their technological pedagogical content knowledge (TPACK) level, how their perceptions of TPACK are affected, and their

thoughts of technology integration into EFL classrooms. The study included both quantitative and qualitative data collection and analysis procedures. 94 Turkish pre-service EFL teachers responded to two questionnaires which were about collecting information about the combination of their technology, pedagogy, and content knowledge. Besides this, six participants were interviewed about their perceptions of TPACK and their thoughts about technology implementation in language teaching processes. The results of the study indicated that both the quantitative and qualitative data supported the high level of perceived TPACK.

To sum up, there are diverse studies about in-service teachers' and pre-service teachers' TPACK level in various fields and it is highly important to determine the role of technology in language learning by considering the outcomes of other studies in the relevant literature. Therefore, this chapter displayed a theoretical database together with the studies and their outcomes carried out in TPACK area.

Chapter 3

Methodology

The aim of the current study is to find out the Technological Pedagogical and Content Knowledge (TPACK) level of in-service EFL instructors, and the frequency of their informal technology use and how the EFL instructors' informal technology use frequency predicts their TPACK level.

The purpose of this chapter is to provide information on the research design and procedures used in this study. It consists of six parts. The first part is about the research design; the second part describes the setting and participants of the present study; the third part explains the data collection instruments; the fourth part is about the data collection procedures; the fifth part is about the analyses of the data and the final part explains the limitations of the study.

3.1 Research Design

The main aims of the present study are (a) to find the technological pedagogical content knowledge levels of in-service EFL instructors, (b) to identify the informal technology use frequency of in-service EFL instructors and (c) to analyze how their informal technology use frequency predicts their TPACK level.

In the current study, the quantitative method was decided to be implemented after considering the aims of the study. In quantitative research, first, the researcher determines what to study about a research problem and then asks specific and narrow questions; collects participants' numerical data and then by using statistics, analyzes these numbers; and administers objective explanations about trends and relationship among variables (Clark & Creswell, 2015).

Creswell (2002) states that after deciding which research method to implement, it is time for the researcher to select which design to use. Quantitative research design can be categorized into five types, namely, true experiments, quasi-experiments, single-subject research, correlational research and survey research. The current study applies a correlational design to correspond to its research questions. Creswell (2002) defines correlational design as predicting scores and explaining the

relationship and association among two or more variables. In the current study, instead of only looking for the relationship among variables, it is pursued to predict the effects by using certain variables as predictors. This type of correlational design is called the prediction research design.

Creswell (2002) explains the prediction research design as identifying variables that make a prediction of an outcome or criterion. In this type of research, the researcher identifies one or more predictor variable and a criterion (or outcome) variable.

A predictor variable can be explained as a variable which is used to make a prediction about an outcome while the outcome that is being forecasted is called the criterion variable in correlational research.

With the implementation of the above-mentioned design, this research study aims at finding answers to the following research questions;

1. What is the TPACK level of in-service EFL instructors?
2. What is the informal technology use frequency of in-service EFL instructors?
3. Does the informal technology use frequency of in-service EFL instructors predict their TPACK level?

3.2 Settings & Participants

Determining the people and places that the researcher plans to study is the very first step in the process of quantitative data collection. The range of the focus group to study can vary and it involves individuals, organizations or some combination. Creswell (2002) indicates that when the researcher chooses individuals or organizations, what kind of people or organization to actually study and how many people needed for the study must be decided. These decisions necessitate that the researcher decides the whole analysis, the group, and individuals to study, the procedure of picking the individuals and determine the numbers of people required for data analysis.

Considering the purpose of the present study, in-service EFL instructors were picked for the target population. "Within this target population, researchers then select a sample for the study. A sample is a subgroup of the target population that the

researcher plans to study for generalizing about the target population." (Creswell, 2002, p.142). The sample group for the present study was determined as in-service EFL instructors. The target group was chosen with the technique of convenience sampling which is the kind of non-probability sampling. Creswell (2002) indicates that in convenience sampling the participants are chosen because they are eager and convenient to get involved in the study. That is why; the sample has the potential to contribute valuable information in order to answer questions and assumptions.

A total of 105 voluntary in-service EFL instructors took part in the study. As it can be observed in Table 4, 69 (65,7%) of the participants were female while 36 (34,3%) of them were male.

Table 1

The Distribution of the Participants Based on Gender

Gender	Frequency	Percent
Female	69	65.7
Male	36	34.3
Total	105	100.0

The participants were also asked to indicate their ages. As it is seen in Table 5, 43 (41,0 %) of the participants were 25 years old and above, 30 (28,6 %) of the participants were between 26 and 30 years old while 32 (30,5%) of them were 31 years old and above.

Table 2

The Distribution of the Participants Based on Age

Age	Frequency	Percent
25 years and above	43	41.0
26-30 years	30	28.6
31 years and above	32	30.5
Total	105	100.0

The Participants were in-service EFL instructors who are currently working in either state or foundation universities in Turkey. As it is indicated in table 6, 69 (65,7%) of the participants were working in state universities while 36 (34,3%) of them were working in foundation universities.

Table 3

The Distribution of the Participants Based on the Type of University They Work in

Type of University	Frequency	Percent
State	69	65.7
Foundation	36	34.3
Total	105	100.0

The Participants also indicated their years of experience (Table 7) by picking one of the given intervals. Those intervals were 0-1 years, 2-5 years, 6-10 years, 11-15 years, 16-20 years, 21 years and above. As table 7 displays 4,8 percent of the participants ($n=5$) had from 0 to1 year of experience, 61,0 percent of them ($n=64$) had from 2 to 5 years of experience. While 17,1 percent of them ($n=18$) had from 6 to 10 years of experience, 4,8 percent ($n=5$) had from 11 to 15 years of experience. Finally, 3,8 percent ($n=4$) of the participants had from 16 to 20 years of experience while 8,6 percent ($n=9$) of them had 21 and more years of experience.

Table 4

The Distribution of the Participants Based on Years of Experience

Years of experience	Frequency	Percent
0-1 year	5	4.8
2-5 years	64	61.0
6-10 years	18	17.1
11-15 years	5	4.8
16-20 years	4	3.8
21 years and above	9	8.6
Total	105	100.0

The participants' major fields in their Bachelor's degree were also obtained data. As it can be seen in table 8, 64,4 percent ($n=67$) of the participants' major was English language and teaching, 15,4 percent ($n=16$) of the participants' major was English language and literature. 12 (11,5%) participants indicated that their major was Translation and Interpreting, while 8 (7,7%) of them stated that their major was American culture and literature. Lastly, only 2 (2,0%) participants indicated that their major was Linguistics.

Table 5

The Distribution of the Participants Based on Major in BA

Major in BA	Frequency	Percent
English language teaching	67	64.4
English language and literature	16	15.4
Translation and Interpreting	12	11.5
American culture and literature	8	7.7
Linguistics	2	2.0
Total	105	100.0

The daily use of technological devices of the participants in their personal life was also asked to them. It was a checkbox type of question in which participants ticked the technological devices they use daily. As it can be seen from table 9, 93,3 percent of the participants ($n=98$) use a personal computer, 28 (26,7 %) participants use a tablet. While 99 (94,3%) participants use a smartphone, 6,7 percent of the participants ($n=7$) use smartwatch. Finally, 11 (10,5%) participants use game console.

Table 6

The Distribution of the Participants Based on the Technological Device They Use Daily in Their Personal Life

Technological device	Frequency	Percent
Personal computer	98	93.3
Tablet	28	26.7
Smartphone	99	94.3
Smartwatch	7	6.7
Game console	11	10.5

How much time the participants spend on the Internet on a daily basis in their personal life (Table 10) was also asked to them. In accordance with the findings, 3 (2,9%) of the participants stated that they spend less than 1 hour on the Internet. 58 (55,2%) participants indicated that they spend time on the Internet between one and three hours, while 40 (38,1%) of them reported the time as between 4 and 5 hours. Lastly, 4 (3,8%) told that they spend 6 or more hours on the Internet.

Table 7

The Distribution of the Participants Based on the Time They Spent on the Internet Daily in Their Personal Life

Time	Frequency	Percent
Less than 1 hour	3	2.9
Between 1 and 3 hours	58	55.2
Between 4 and 5 hours	40	38.1
6 or more hours	4	3.8
Total	105	100.0

In the study, these demographic information and technology use items were involved as it was considered beneficial to get to know the participants better and acknowledge their technology uses and beliefs thoroughly.

3.3 Procedure

In this part of the research, detailed information about data collection instruments, data collection procedures, data analysis procedures, reliability and validity and limitations of the study are included.

3.3.1 Data collection instruments. An instrument is a tool for measuring, observing, or recording quantitative data. By considering the aims of the study, the researcher prepared an online questionnaire by using Google forms. An online questionnaire was chosen because of the advantages it brought. It is possible to collect data easily and efficiently. Furthermore, it stores the received feedback so it is easy to analyze in detail and convenient for the participants to complete as the access to it is very simple. The questionnaire consisted of three sections which are demographic information questionnaire, the TPACK-EFL survey, Formal/Informal technology use survey.

The first section of the questionnaire started with questions about the participants' demographic features (see Appendix A, part I). The participants were first asked to indicate their gender, age, the university they work in, their teaching experience and major in their Bachelor's degree. Then, they were supposed to answer some questions about their technology use habits. Those questions were about determining their daily used technological device possessions and their daily use of internet outside school. Therefore, the first section of the questionnaire was helpful to the researcher to know the participants demographically.

The second section of the questionnaire was a survey designed by Başer (2015) called the TPACK-EFL survey (see Appendix A, part II). In the field, there were also some other TPACK surveys which could be preferred yet as the present survey (TPACK-EFL) is specifically developed with the purpose of assessing EFL teachers and although other TPACK surveys use a five-point scale, a nine-point scale can help improve the accuracy of in-service instructors' self-assessments, it was considered to be the most appropriate one. The survey of TPACK-EFL was promoted and evaluated as an assessment tool to support pre-service EFL teachers with self-assessment opportunity of their TPACK levels. The items of the TPACK-EFL survey were developed with the implementation of qualitative data, the content

and construct validity of the survey were both controlled over different processes. For the content validity, specialist and pre-service teacher reviews, cognitive interview, literature, and document analysis were implemented while the construct validity was assessed through two validation rounds and it was provided via exploratory factor analysis (EFA) indicating a seven-factor structure describing 70.42% of the variance in the model. Consequently, the final TPACK-EFL survey included 39 items in total indicating the categories of TPACK framework were, 9 technological knowledge (TK); 5 content knowledge (CK); 6 pedagogy knowledge (PK), 5 pedagogical content knowledge (PCK), 7 technological pedagogical knowledge (TPK), 3 technological content knowledge (TCK) and 4 technological pedagogical content knowledge (TPACK) descriptively and it made use of a nine-point rating scale ranging from 'nothing/ none' (1) to 'very little' (3) to 'some' (5) to 'quite a bit' (7) to 'a great deal' (9). Therefore, the participants were to pick the best score that reflected their own ideas about their technology, pedagogy and content knowledge competencies. The researcher acknowledged participants' TPACK levels through this section of the questionnaire.

The third section of the questionnaire was a survey designed by Wang et al. (2014) called the Formal and Informal Technology Use Survey (see Appendix A, part III). The questionnaire normally consists of three sections: (1) technology ownership; (2) technology experience outside of school and (3) technology experience inside of school. Yet, for the present study, only the second section was implemented. The Formal and Informal Technology Use Survey was developed through three stages. The first step was to review literature about the integration of ICT in the classroom to establish observation protocols and to classify the study-related ICTs. The second step was to advise and analyze observation items by five researchers that are specialized in technology integration, research methods and statistics analysis. Then, the third step was about piloting the survey. The Formal and Informal Technology Use Survey consisted of 15 items in a 1–5 response scale (1 = never, 2 = once a year, 3 = once or twice a month, 4 = once or twice a week, 5 = almost every day). This section of the questionnaire assisted the researcher to acknowledge participants' informal technology use frequencies.

3.3.2 Data collection procedure. In English as a foreign language (EFL) teaching field, there exist a number of studies measuring pre-service and in-service EFL teachers' TPACK level. In some of these studies, TPACK surveys were studied with other scales to discover a relationship with each other. Yet, there was not any study discovering the relationship between the TPACK level and Informal technology use. Resulting from this issue, the formal/informal technology use survey was involved in the present study to contribute to the field. Then, the procedure of data collection started.

Creswell (2002) argues that the quantitative data collection process consists of five steps. This process does not only include directly collecting information but also interrelated steps. These steps are deciding on the participants to study, asking for permissions that are needed from a number of individuals and organizations, analyzing the kind of information to gather from diverse online sources to the quantitative research, detecting and choosing instruments to implement which will bring in a valuable data for the study and eventually, carrying out the data collection process in order to collect data.

In the present study, firstly the framework was decided then the aims of the study were agreed upon and finally the target population was selected as in-service EFL instructors. Later on, the data collection tool which was decided to be an online questionnaire was designed. The questionnaire first included demographic information of the participants. Secondly, after reviewing the field about all TPACK surveys, TPACK-EFL survey which was developed by Başer (2015) was thought to be the most appropriate one to be used and included in the part. Lastly, the Formal/Informal Technology Use Survey which was developed by Wang et al. (2014) was chosen for the purposes of the study. All parts of the questionnaire were prepared on an online platform, Google Forms, and sent to participants who are the in-service EFL instructors from various universities in Turkey. The data collection process lasted nearly six weeks.

3.3.3 Data analysis. In the present study, the implemented type of methodology was quantitative. It was used to show whether the in-service EFL instructors' informal technology use frequency predicts their TPACK level. For the data analysis procedure, both descriptive and inferential statistics were implemented

and completed by statistical package for the social sciences (SPSS) 22.0. For descriptive statistics, central tendency, frequency and variability were analyzed to determine the demographic inventory of the participants by gender, age, years of experience, major in BA and technology use habits.

For answering the first question, TPACK scores were analyzed based on a 9 point scale. This rubric indicated the participants' TPACK levels. Descriptive statistics methods including mean and standard deviation were implemented to demonstrate the participants' TPACK levels.

In order to answer the second question, Formal/Informal technology use frequency was evaluated with a 5 point scale. This rubric indicated the participants' informal technology use frequency. Descriptive statistics methods including mean and standard deviation were implemented to determine the participants' informal technology use frequency.

For the third question, regression analysis was used to answer how the in-service EFL instructors' informal technology use frequency predicts their TPACK level.

Table 8

Overview of Research Questions and Corresponding Procedures

Research Questions	Instruments	Data Analysis
1. What is the TPACK level of in-service EFL instructors?	TPACK-EFL survey (Survey, Part 2) (Başer, 2015).	Descriptive Statistics
2. What is the informal technology use frequency of in-service EFL instructors?	Formal/informal technology use survey (Survey, Part 3) (Wang et al., 2014).	Descriptive Statistics

Table 8 (Cont'd)

Research Questions	Instruments	Data Analysis
3. Does the informal technology use frequency of in-service EFL instructors predict their TPACK level?	TPACK-EFL survey Formal/informal technology use survey	Regression analysis

3.3.4 Reliability. In order to calculate the reliability of the subscales and also the whole scale of TPACK-EFL, reliability analyses were performed. Cronbach's alpha reliability coefficient of technological knowledge (TK) was .86, of (CK) was .87, of pedagogical knowledge (PK) was .83, of pedagogical content knowledge (PCK) was .85, of technological content knowledge (TCK) was .69, of technological content knowledge (TCK) was .84 and of technological pedagogical content knowledge (TPACK) was .86. The reliability of the whole TPACK-EFL scale was .93.

Table 9

Cronbach's Alpha Reliability Coefficient of TPACK-EFL

Sub-dimension	Number of items	Cronbach's Alpha
TK (Technological knowledge)	9	.86
CK (Content knowledge)	5	.87
PK (Pedagogical knowledge)	6	.83
PCK (Pedagogical content knowledge)	5	.85
TCK (Technological content knowledge)	3	.69
TPK (Technological pedagogical knowledge)	7	.84
TPACK (Technological pedagogical content knowledge)	4	.86
TPACK-EFL whole survey	39	.93

In order to calculate the reliability of the Informal technology use scale, reliability analyses were performed. Cronbach's alpha reliability coefficient of the whole scale was .77.

Table 10

Cronbach's Alpha Reliability Coefficient of Informal Technology Use Scale

	Number of items	Cronbach's Alpha
Informal technology use scale	15	.77

3.4 Limitations

It is expected that the present study would contribute significantly to TPACK literature, especially in EFL education. However, the limitations of the study should be discussed for the sake of further studies. The first limitation of this study was that the target group included in-service instructors. The number of participants who volunteered to take part in this study was lower than expected. This limited sample size resulted from the unwillingness of in-service instructors as they were engaged with their jobs, they did not have time to complete the survey.

The second limitation of the study was implementing only quantitative methodology. The collected data using the questionnaire was considered sufficient to address research questions and deal with research problems. Nonetheless, including interview questions for qualitative data would help the researcher to consider the study from different aspects in order to understand the research problem more thoroughly.

Chapter 4

Findings

The present study aimed to find out in-service EFL instructors' TPACK level, and their informal technology use frequency, and how their informal technology use frequency predicts their TPACK level. Taking these aims into consideration, three research questions for the study were as follows:

1. What is the TPACK level of in-service EFL instructors?
2. What is the informal technology use frequency of in-service EFL instructors?
3. Does the informal technology use frequency of in-service EFL instructors predict their TPACK levels?

In this section, the collected data and the statistical treatment is outlined in detail to justify the conclusions considering the research questions that are given above.

4.1 Findings of the Research Question 1

The first research question of the study which aimed to introduce in-service EFL instructors' technological pedagogical content knowledge (TPACK) level is answered through this section. The findings were collected via the TPACK-EFL survey in the second part of the questionnaire. In this section, it was expected from participants to pick the best score for each item that reflects their own ideas about their technology, pedagogy and content knowledge competences. As mentioned earlier in the methodology chapter, the TPACK-EFL survey included 39 items and the items were scored from 1 to 9.

Table 11

The Descriptive Results of the TPACK Knowledge Types

	Number of items	n	Minimum	Maximum	Mean	SD
Technological knowledge (TK)	9	105	3.00	9.00	7.45	1.18
Content knowledge (CK)	5	105	5.20	9.00	8.64	0.67
Pedagogical knowledge (PK)	6	105	5.17	9.00	7.83	0.92

Table 11 (cont'd)

	Number of items	n	Minimum	Maximum	Mean	SD
Pedagogical content knowledge (PCK)	5	105	3.40	9.00	7.95	0.98
Technological content knowledge (TCK)	3	105	3.33	9.00	7.32	1.41
Technological pedagogical knowledge (TPK)	7	105	3.71	9.00	7.52	1.04
Technological pedagogical content knowledge (TPCK)	4	105	2.50	9.00	7.23	1.40
TPACK-EFL	39	105	5.64	9.00	7.71	0.79

The mean scores of the TPACK-EFL survey including 39 items vary from 7.23 to 8.64. The results indicate that CK has the highest mean score ($M=8.64$, $SD=0.67$) viewed by the English language instructors which is between “7- quite a bit” and “9- a great deal”, but closer to “9- a great deal”. This result means that the participants consider themselves competent enough in their content area which is the English language. The highest mean score in CK is shared between two items which are “I can express my ideas and feelings by writing in English.” ($M=8.69$) and “I can read texts written in English with the correct pronunciation.” ($M=8.69$) and the lowest one is “I can understand the speech of a native English speaker easily.” ($M=8.50$). CK also has the lowest SD of all, which shows that this knowledge type did not vary widely from other types of knowledge. On the contrary, the lowest mean score is in TPCK ($M=7.23$, $SD=1.40$). That is to say, participants do not think that they are highly competent in integrating technology and sound pedagogy into their content teaching. The highest mean score is for the item “I can support my professional development by using technological tools and resources to continuously improve the language teaching process.” ($M=7.87$) and the lowest one is “I can use collaboration tools (e.g. wiki, 3D virtual environments, etc.) to support students’ language learning.” ($M=6.71$).

The mean scores of other knowledge types and standard deviations are from highest to lowest are; PCK ($M=7.95$, $SD=0.98$), PK ($M=7.83$, $SD=0.92$), TPK ($M=7.52$, $SD=1.04$), and TK ($M=7.45$, $SD=1.18$) and TCK ($M=7.32$, $SD=1.41$) were slightly above “7- quite a bit”. In PCK, the highest mean score is for the item “I can

manage a classroom learning environment." ($M=8.04$) and the lowest one is " I can use appropriate teaching methods and techniques to support students in developing their language skills." ($M=7.88$). As for PK, the item which has the highest mean score is " I can use teaching methods and techniques that are appropriate for a learning environment." ($M=8.24$) ; on the contrary, the lowest one is "I can collaborate with school stakeholders (students, parents, teachers, etc.) to support students' learning." ($M=7.45$). The highest mean score for TPK is for the item " I can use multimedia such as videos and Web sites to support students' learning." ($M=7.84$) whereas the lowest one is " I can support students as they use technology such as virtual discussion platforms to develop their higher-order thinking abilities." ($M=7.06$). The highest mean in TK is the item "I can use digital classroom equipment such as projectors and smart boards." ($M=8.12$) the lowest is " I can use collaboration tools (wiki, Edmodo, 3D virtual environments, etc.) in accordance with my objectives." ($M=6.35$).

Finally, the highest mean in TCK is for the item " I can take advantage of multimedia (e.g. video, slideshow, etc.) to express my ideas about various topics in English." ($M=8.37$) while the lowest mean acknowledged by the participants is for the item " I can use collaboration tools to work collaboratively with foreign persons (e.g. Second Life, wiki, etc.)." ($M=6.62$) . The detailed item analysis of the survey is given in the table below. (see Appendix B)

To sum up, the mean score of the whole TPACK-EFL scale is calculated as ($M=7.71$) which clearly indicates that in-service EFL instructors have a high level of TPACK. When we look at the knowledge types respectively. The 4 knowledge types' mean scores are lower than the mean score of TPACK-EFL. These are TPK ($M=7.52$), TK($M=7.45$), TCK($M=7.32$) and TPCK($M=7.23$). On the other hand, the 3 knowledge types' mean scores are higher than the mean score of TPACK-EFL. These are PK($M=7.83$), PCK($M=7.95$) and CK($M=8.64$).

4.2 Findings of the Research Question 2

The second research question of the study which aimed to present in-service EFL instructors' informal technology use frequency is answered through this section. The findings were collected via the Formal and Informal Technology Use Survey in

the third part of the questionnaire. In this section, it was expected from participants to pick the best score that reflects their frequency of uses for each item. As mentioned previously in the methodology chapter, in this part of the questionnaire there were 15 items with 1–5 response scale (1 = never, 2 = once a year, 3 = once or twice a month, 4 = once or twice a week, 5 = almost every day). Table 12 displays the number and percentage of the participants' selections item by item and also the mean scores and standard deviation of the usage frequency of each item are calculated. According to the results, the most frequently used items are Web Search engines (e.g. Google, Yahoo, Bing) ($M=4,94$), Text messages (cellphone text, Whatsapp) ($M=4,93$), Youtube ($M=4,80$), Computer installed Word processing tool (e.g Word, Pages) ($M=4,64$), Social networking tool (Facebook, Twitter, Instagram) ($M=4,58$) and the least frequently used items are Second Life/OpenSim/Stimulated Reality ($M=1,81$), Movie production tool (iMovie, MovieMaker) ($M=2,24$), Blog ($M=2,52$), Web editing tool (Google Site) ($M=2,55$) and Google Earth ($M=2,69$).

101 (96,2%) participants indicated that they use Web Search engines (e.g. Google, Yahoo, Bing) almost every day while no one 0 (0,0%) said they never use it, therefore, this made the item the most frequently used one. On the other hand, only 2 (1,9%) participants stated that they use Second Life/Open Sim/Stimulated Reality almost every day while 54 (51,4%) participants told that they never use it, therefore, this made the item the least frequently one.

To sum up, the mean score of all items' usage frequency in Formal/Informal technology use scale is calculated as ($M=3.64$) which is between 3 = once or twice a month and 4 = once or twice a week in the 1–5 response scale. It can be considered as in-service EFL instructors had higher frequencies of informal technology use.

Table 12

Descriptive Results of the Informal Technology Use Scale

	Never		Once a year		Once or twice a month		Once or twice a week		Almost everyday		Mean
	n	%	n	%	n	%	n	%	n	%	
1. Computer installed Word processing tool (e.g Word, Pages)	0	0,0	0	0,0	6	5,7	26	24,8	73	69,5	4,64
2. Computer installed Spreadsheet tool (e.g Excel)	2	1,9	11	10,5	29	27,6	34	32,4	29	27,6	3,73
3. Computer installed presentation tool (e.g Power Point, Keynote)	0	0,0	7	6,7	30	28,6	38	36,2	30	28,6	3,87
4. Google docs	5	4,8	10	9,5	24	22,9	28	26,7	38	36,2	3,80
5. Maps (e.g Google Map, MapQuest)	1	1,0	3	2,9	14	13,3	32	30,5	55	52,4	4,30
6. Google Earth	17	16,2	29	27,6	38	36,2	12	11,4	9	8,6	2,69
7. Social networking tool (Facebook, Twitter, Instagram)	8	7,6	1	1,0	3	2,9	3	2,9	90	85,7	4,58
8. Blog	30	28,6	19	18,1	34	32,4	15	14,3	7	6,7	2,52
9. Youtube	0	0,0	0	0,0	1	1,0	19	18,1	85	81,0	4,80
10. Second Life/OpenSim/Stimulated Reality	54	51,4	23	21,9	24	22,9	2	1,9	2	1,9	1,81
11. Web editing tool (Google Site)	43	41,0	13	12,4	19	18,1	8	7,6	22	21,0	2,55
12. Movie production tool (iMovie, MovieMaker)	28	26,7	40	38,1	25	23,8	8	7,6	4	3,8	2,24
13. Instant messengers or video conferencing tools (e.g. Skype, Facetime, Msn)	15	14,3	18	17,1	31	29,5	16	15,2	25	23,8	3,17
14. Text messages (cellphone text, Whatsapp)	0	0,0	1	1,0	2	1,9	0	0,0	102	97,1	4,93
15. Web Search engines (e.g. Google, Yahoo, Bing)	0	0,0	0	0,0	2	1,9	2	1,9	101	96,2	4,94

4.3 Findings of the Research Question 3

The third research question of the study is answered through this section. Regression analysis was implemented to present how the EFL instructors' informal technology use frequency predicts their TPACK level. The effect of informal technology use is calculated for all seven knowledge types of TPACK.

Firstly, Table 13 presents the regression test results with the purpose of detecting the effect of informal technology use on technological knowledge. The established regression model is relatively significant ($F=7,444$ $p<0,05$). According to this, when the coefficient is analyzed, informal technology use moderately predicts technological knowledge ($B=.371$ $p<0,05$). The 7% of the change in technological knowledge is explained by informal technology use.

Table 13

The Effect of Informal Technology Use on Technological Knowledge

Dependent Variable	Independent Variable	Coefficient (B)	t	p	R2
Technological knowledge	Informal technology use	.371	2.728	.007	.067

Model $F=7,444$ $p<0,05$

Secondly, Table 14 presents the results of the regression test with the purpose of detecting the effect of informal technology use on content knowledge. The established regression model is not significant ($F=.261$ $p>0,05$). Therefore, it is concluded that content knowledge cannot be explained by informal technology use.

Table 14

The Effect of Informal Technology Use on Content Knowledge

Dependent Variable	Independent Variable	Coefficient (B)	t	p	R2
Content knowledge	Informal technology use	-.023	-.511	.611	.003

Model $F=.261$ $p>0,05$

Thirdly, Table 15 presents the results of the regression test with the aim of detecting the effect of informal technology use on pedagogical knowledge. The established regression model is relatively significant ($F=4,393$ $p<0,05$). According to this, when the coefficient is analyzed, informal technology use predicts pedagogical knowledge positively ($B=.150$ $p<0,05$). The 4% of the change in pedagogical knowledge is explained by informal technology use.

Table 15

The Effect of Informal Technology Use on Pedagogical Knowledge

Dependent Variable	Independent Variable	Coefficient (B)	t	p	R2
Pedagogical knowledge	Informal technology use	.150	2.096	.039	.041

Model $F=4,393$ $p<0,05$

Table 16 presents the results of the regression test with the aim of detecting the effect of informal technology use on pedagogical content knowledge. The established regression model is not significant ($F=.480$ $p>0,05$). Therefore, it is concluded that pedagogical content knowledge cannot be explained by informal technology use.

Table 16

The Effect of Informal Technology Use on Pedagogical Content Knowledge

Dependent Variable	Independent Variable	Coefficient (B)	t	p	R2
Pedagogical content knowledge	Informal technology use	.045	.693	.490	.005

Model $F=.480$ $p>0,05$

Table 17 presents the results of the regression test with the aim of detecting the effect of informal technology use on technological content knowledge. The established regression model is statistically significant ($F=33,972$ $p<0,05$). According to this, when the coefficient is analyzed, informal technology use predicts technological content knowledge positively ($B=.283$ $p<0,05$). The 25% of the change in technological content knowledge is explained by informal technology use.

Table 17

The Effect of Informal Technology Use on Technological Content Knowledge

Dependent Variable	Independent Variable	Coefficient (B)	t	p	R2
Technological content knowledge	Informal technology use	.283	5.829	.000	.248

Model F=33,972 p<0,05

Table 18 presents the results of the regression test with the aim of detecting the effect of informal technology use on technological pedagogical knowledge. The established regression model is significant (F=18,452 p<0, 05). According to this, when the coefficient is analyzed, informal technology use predicts technological pedagogical knowledge positively (B=,381 p<0, 05). The 15% of the change in technological pedagogical knowledge is explained by informal technology use.

Table 18

The Effect of Informal Technology Use on Technological Pedagogical Knowledge

Dependent Variable	Independent Variable	Coefficient (B)	t	p	R2
Technological Pedagogical knowledge	Informal technology use	.381	4.296	.000	.152

Model F=18,452 p<0,05

Table 19 presents the results of the regression test with the aim of detecting the effect of informal technology use on technological pedagogical content knowledge. The established regression model is statistically significant (F=21,670 p<0,05). According to this, when the coefficient is analyzed, informal technology use predicts technological pedagogical content knowledge positively (B=,315 p<0,05). The 17% of the change in technological pedagogical content knowledge is explained by informal technology use.

Table 19

The Effect of Informal Technology Use on Technological Pedagogical Content Knowledge

Dependent Variable	Independent Variable	Coefficient (B)	t	p	R2
Technological Pedagogical Content knowledge	Informal technology use	.315	4.655	.000	.174

Model F=21,670 p<0,05

Lastly, Table 20 presents the results of the regression test with the aim of detecting the effect of informal technology use on TPACK-EFL. The established regression model is significant ($F=16,630$ $p<0,05$). According to this, when the coefficient is analyzed, informal technology use moderately predicts TPACK-EFL ($B=1,521$ $p<0,05$). The 14% of the change in TPACK-EFL is explained by informal technology use.

Table 20

The Effect of Informal Technology Use on TPACK-EFL

Dependent Variable	Independent Variable	Coefficient (B)	t	p	R ²
TPACK-EFL	Informal technology use	1.521	4.078	.000	.139
Model $F=16,630$ $p<0,05$					

To sum up, the findings which were obtained from the statistical analysis to display in-service EFL instructors' TPACK level, informal technology use and the predictive power of informal technology use on in-service EFL instructors' TPACK level were demonstrated in this section. As stated above, the 14% of the change in TPACK-EFL is explained by informal technology use. In the next chapter, assessments, and interpretations of the results considering the research questions are introduced.

Chapter 5

Discussion and Conclusion

In the present study, in-service EFL instructors' TPACK level, their frequency of informal technology use, and how the EFL instructors' frequency of informal technology use predicts their TPACK level were studied. The quantitative method was decided to be implemented after considering the aims of the study. A total of 105 in-service EFL instructors from both state and foundation universities in Turkey took part in the study by completing an online questionnaire. After the voluntary answers which were obtained from the participants by completing the questionnaire, SPSS was used to get analyses. The findings collected from the questionnaire that was prepared based on the research questions were given in the former chapter. This chapter is the last one of the current study evaluating and describing the implications of the results in accordance with the research questions. This chapter consists of four parts. Firstly, the findings of the research questions are discussed considering the connections with previous studies. Secondly, the pedagogical implications of the research study are presented. Then, the importance of the findings and conclusions are given, and lastly, recommendations for future studies are mentioned.

5.1 Discussion of the Findings for Research Questions

In this section, the findings of each research question are discussed considering the connections with the studies conducted previously.

5.1.1 Discussion of the findings for the first research question. This section discusses findings for the following research question: What is the TPACK level of in-service EFL instructors?

One of the main findings of this research study was the TPACK level of in-service EFL instructors. This study included the TPACK framework because it was an effective framework for defining teachers' knowledge required for planning, implementing, and assessing curriculum and instruction with technology (Niess, 2011). There exist several data collection instruments analyzing TPACK in the

literature. However, none of them were specialized in the EFL context except one. The data collection instrument which was used in this study was the TPACK-EFL scale (Başer, 2015). TPACK-EFL is an instrument measuring participants' TPACK level within the context of EFL and providing teacher educators with a valid and reliable tool to discuss the unique pedagogical and technological approaches to education that the EFL community respects the most. Therefore, it was decided to be the most appropriate one for this research.

The findings of the first research question displayed that in-service EFL instructors' TPACK level was high. Considering this outcome, the present research study has similarities with other studies that are conducted in the field adopting the same scale with pre-service teachers. Sarıçoban et al. (2019) also used the TPACK-EFL scale in their study to measure the TPACK level of 77 pre-service EFL teachers learning to teach EFL. They came up with the results indicating that pre-service EFL teachers had a satisfactory level of competence in TPACK; however, there were also some areas in which they needed development. The pre-service teachers who took part in this study were probably having an effective teacher education enriched with proper uses of technology in classroom teaching.

The collected data from the TPACK-EFL survey indicates that English language instructors believe that they are most efficient in their subject matter, which is English and is categorized as content knowledge. This outcome is not unexpected at all as it is highly important for them to have the essential knowledge in all four competences in their field of content and are therefore able to teach effectively. Their pedagogical knowledge also supports the results of the knowledge of the content that English language teachers consider themselves effective in the design of the courses, arranging learning activities, implementing the the correct teaching methods and techniques relevant to the learning environment, helping students learn within and outside the classroom, and leading the classroom towards an efficient teaching and learning cycle. These results are not surprising as most of the participants have graduated from English language teaching department where they had sufficient courses related to pedagogical knowledge. By looking at the technological knowledge, it can be inferred that in-service EFL instructors can use digital classroom equipment such as projectors, smart boards and computer peripherals such

as a printer, a headset, and a scanner. However, they feel less competent in using interactive tools (wiki, Edmodo, 3D virtual environments, etc.) in line with their objectives and creating multimedia (e.g. video, Web pages, etc.) using text, images, sound, video, and animation.

As mentioned earlier in the findings, the lowest mean scores are found in TPACK since the English language teachers did not consider that they were highly efficient enough to integrate technology with sound pedagogy into their content teaching. Even though they believed that they could support their professional development by using technological tools and resources to develop the language teaching process continuously, they did not feel comfortable in using collaboration tools (e.g. wiki, 3D virtual environments, etc.) to support students' language learning. This situation may result from the lack of training they had in their pre-service education or lack of professional development and encouragement to use technology. Looking at the results of the factor analyses, these findings indicated some similarities with other studies in the field. Köse (2016) also used the TPACK-EFL scale in order to investigate the perceptions of 127 English language instructors' TPACK level. The results of the study suggested that English language teachers were the most knowledgeable in their subject matter, English. Yet, they did not think they were highly skilled in incorporating technology with sound pedagogy into their content teaching. The findings of this study share nearly the same results with the findings of the present study. In both studies, in-service EFL instructors consider themselves most competent with content knowledge whereas they feel least competent with technological pedagogical and content knowledge. This outcome was not unexpected, because, in order to teach effectively, they had to possess the essential knowledge of all four competences to their content area. Their pedagogical knowledge also followed the findings of the content knowledge that the English language instructors saw themselves as effective in developing the courses, planning learning activities, implementing the necessary teaching methods and techniques adapted to the learning environment, improving the performance of students in and out of the classroom and managing the classroom for an effective learning and teaching process.

The TPACK scores by items which are gathered from this study are mostly consistent with the study of Handal et al. (2013). The moderate mean score in TPACK

can be explained by familiarity with technology in daily life and in-service teacher training on using technology. In general, the participants stated that they use various technologies in their personal life in order to communicate or get information. According to a study conducted by Menzi et al. (2012), teachers that possess personal technological devices consider themselves more efficient in the technology field than those who do not possess. Therefore, this may explain why the participants' attitude is moderate in technology-related knowledge in this study. Yet, as displayed in other studies (Harris et al., 2009; Lei, 2009), the use of communication and information technology does not in any way lead to the integration of technology in the classroom. Instructors used technology to communicate daily but required competence or vision in order to bring this technology knowledge forth use in instruction.

Furthermore, the findings of the first research question are quite in line with the study of Mahdum (2015). The study investigates the TPACK levels of high school English teachers in Indonesia. According to the results of the survey, the TPACK levels of English teachers are considered to be in “good” category in general, which indicates that they could integrate technology, content and pedagogy so as to perform well learning and teaching. Additionally, the mean score of technology-related subdomains was lower than non- technology subdomains which implied that they were not competent in technological knowledge a lot just like it is in the present study.

In conclusion, as results indicated, in-service EFL instructors had a high level of TPACK and based on the self-evaluation of them, it was seen that they consider themselves sufficient in terms of almost all sub-dimensions of TPACK. It is acknowledged in the literature that teacher actions in the classroom and student learning get affected by teacher knowledge. Therefore, a satisfactory TPACK ensures teachers can take advantage of technology in the classroom and improve student learning. But, considering the fact that teachers have relatively low level of TPACK, it might be hard to activate their knowledge and move them beyond their knowledge, as pointed out in literature (McDougall, 2008). Therefore, in-service training and pre-service education are a must as to mobilize the means of teachers in terms of TPACK.

5.1.2 Discussion of the findings for the second research question. In this section, findings for the following research question are discussed: What is the informal technology use frequency of in-service EFL instructors?

Another main finding of this research was the frequency of in-service EFL instructors' informal technology use. The frequency of informal technology use was an indication of how technology was part of the daily lives of the participants. The collected data from the informal technology use scale indicated that the mean score of informal technology use by in-service EFL instructors is calculated as ($M=3.64$). This number indicates that their informal technology use frequency takes place between 'once or twice a month' and 'once or twice a week'. The results of the survey also displayed that the most frequently used technological items are Web Search engines (e.g. Google, Yahoo, Bing), Text messages (cell phone text, Whatsapp), Youtube, Computer installed Word processing tool (e.g. Word, Pages) and Social networking tool (Facebook, Twitter, Instagram). As another side of the coin, the least frequently used technological items are Second Life/OpenSim/Stimulated Reality, Movie production tool (iMovie, MovieMaker), Blog, Web editing tool (Google Site) and Google Earth.

Wang et al. (2014) also investigated the use of technology by middle school teachers and students inside and outside of classrooms to determine whether digital natives are more technology-savvy than their teachers. The Formal and Informal Technology Use Scale which was included in the present study was taken from that study. The results of the study indicated that the mean score of the informal technology use frequency by teachers is ($M=3.0$) which is quite similar to the findings of the present study. Throughout their research, both teachers and students had rich experience outside of school technology but their technology knowledge was not reflected in the classroom. Additionally, there also exists a similar study conducted by the Pew Research Center on K-12 teachers' use of technology inside and outside of school (Purcell et al., 2013). It questioned 2,067 American middle and high school teachers on their experiences inside and outside school technology. The result revealed that teachers were much more advanced in terms of owning technology devices, engaging in Internet activities, and having confidence in their technology skills relative to the overall adult population in the United States.

In conclusion, It was found out that in-service EFL instructors' informal technology use frequency takes place between 'once or twice a month' and 'once or twice a week' which can be considered as higher frequencies of informal technology use.

5.1.3 Discussion of the findings for the third research question. In this section, findings for the following research question are discussed: Does the informal technology use frequency of in-service EFL instructors predict their TPACK level?

The purpose of this study was to find out the prediction power of informal technology use frequency of in-service EFL instructors on their TPACK level. Respecting this aim, technological pedagogical content knowledge framework and informal technology use scale were used. The TPACK framework assisted to determine participants' competency in techno-pedagogical content areas of the teaching profession, while informal technology use scale identified the informal technology use frequency of in-service EFL instructors.

This study was conducted in order to see how the informal technology use frequency of in-service EFL instructors predicts their TPACK level. The results indicated that informal technology use moderately predicts TPACK-EFL and they display a significant relationship but only 14% of the change in TPACK-EFL is explained by informal technology use. Furthermore, considering the components of TPACK respectively, various findings were detected. Out of 7 components, there was not a significant relationship between informal technology use and 2 components which are CK and PCK. However, the findings revealed that there was a significant relationship between informal technology use and 5 components which are TCK, TPACK, TPK, TK, and PK. The prediction power of Informal technology use was highest on TCK while it was lowest on PK. The results were not surprising as they indicate that even though teachers have personal practices with technology, they are not competent enough to integrate technology into classroom effectively which was assumed before. This case was also discussed earlier in the field. Some researchers said that educators could have valuable practices with digital technologies in their personal lives however they did not implement them in all cases of their teachings (Burnett, 2009b, 2011). Moreover, as Dooly (2009) argued, "this nexus between personal and institutional use of technology has not been comfortably

bridged” (p. 364). Therefore, it can be suggested that teachers’ technology practices in their personal lives do not always continue in educational contexts.

The attitudes of teachers towards technology play a key role in their classroom practices (Pajares, 1992). As a result of this reason, several pieces of research were conducted on the attitudes of teachers towards technology. Some researches show that in-service and pre-service teachers have positive attitudes towards technology (Lau & Sim, 2008; Park & Son, 2009) and also related findings were obtained in studies conducted in Turkey (Aydın, 2013; Çelik, 2013). But, even though the positive attitudes they display, pre-service teachers who are viewed as digital natives generally use technologies in order to share on social networks and browse the Internet for entertainment intentions; they require training about how to use technology with educational purposes and teacher training programs should provide this training (Lei, 2009). By means of the findings that are gathered, the present study resembles some of the previous studies from the perspectives of learners. In the study of Polat (2017), the interview data concluded that as some EFL learners felt like they were dependent on technologies like social networking sites or mobile devices, they carried on using new technologies. Yet, some of the participants did not think these major technologies were an essential part of their language learning processes as proposed by survey items even though they might have thought they were dependent on specific technologies in their personal life.

The negative attitudes towards integrating technology into classroom (even if personal use of it is being practiced) may also result from the fear of being replaced by computer and some other external factors such as insufficient ICT infrastructure, lack of professional ICT trainings, time restraint, workload, digital divide, lack of administrative and colleagues support, etc. However, these factors seriously hurt our education system and as it was discussed in the literature review part before, teacher education is of great importance at this point.

On the other hand, the present study contrasted with another study that was carried out by Tour (2015). The study researcher also looked at the technologies used by teachers in personal life and teaching. The research presented results from a broader qualitative study and explored the connection between the use of technology in the personal and professional fields of language teachers. But, the results of the study indicated that “teachers’ use of digital technologies in classrooms is not

isolated. Their everyday digital literacy practices and digital mindsets are not left behind at the classroom door: they are brought into the classroom and affect what happens there” (p. 136). In addition, the study listed seven different digital technology affordances as considered by the participants which are support, connectedness, experimentation, sharing, collective intelligence, empowerment, multimodality. But of course, there existed differences in how the participants comprehended and implemented them. Another study by Yuen and Ma (2002) also contrasted with the present study. They investigated pre-service teachers' computer acceptance by implementing the technology acceptance model (TAM) framework and stated that teachers' intentions to integrate computers in the classroom are positively affected by the recognized usefulness of the technology. Teachers who indicated high personal usage rates were more likely to incorporate computers into their classrooms. In fact, when a computer became known as user friendly, teachers appeared to find its utility and expected to use it in the classroom. Therefore, if enough attention is not given to developing a positive attitude of the ease of use, teachers will not develop the required computer competences and a positive intention for computer use even after extended training. Lastly, without an analysis of how to integrate computers with teaching and learning mindsets, computers might not be considered as efficient at all. So, training should not be decontextualized from practices (Lankshear, Snyder, & Green, 2000).

The research studies on teachers' uses and notions of technologies in personal and professional contexts together are not very comprehensive and offer considerably inconsistent views. Therefore, as a result, it is also not possible to generalize the predictive power of informal technology use on TPACK competence. The results may vary based on various perspectives.

5.2 Pedagogical Implications

The findings of this study suggest both empirical and practical implications for educators and educational researchers. Because teaching with technology is different and special rather than without technology, it is extremely important to educate pre-service and in-service teachers about the relationships between technology, pedagogy and content (Abera, 2014), and the way technology is used in order to build real interactions develops collaboration and benefits creativity between students (Wu & Wang, 2015).

Even though present teacher training programs offer well-designed courses assisting in the use of technology for pre-service teachers, it is acknowledged that most EFL teachers have not had enough opportunity in their professional training (Saglam & Sert, 2012). Therefore, the first implication would be about pre-service EFL teacher training. As, training qualified teachers is significant for quality learning effects among learners of language and that “the quality of an education system cannot exceed the quality of its teachers” (Barber & Mourshed, 2007, p.7), the results of the current study suggest the obligation for training quality teachers in the pre-service teacher education programs. So, it is highly important to focus on the use of developed technological knowledge as it is beneficial for both the lecturers and pre-service teachers in teacher education programs. The pre-service teachers who possess sufficient technological knowledge and competence can integrate technology along with technological knowledge with a subject matter and can operate between interconnected sections like a professional who can cross the boundaries of pedagogy, technology and subject matter (Baran et al., 2011; Mishra & Koehler, 2006). Hence, curriculum planners who take part in planning teacher education programs should support an environment that is rich in technology for pre-service teachers and engage them in activities that assist them to develop techno pedagogical teaching materials that will contribute to strong learning outcomes. For example, workshop studies can be efficient in developing pre-service EFL teachers’ awareness of productive uses of technology in classes for educational aims. Through producing real learning materials, pre-service EFL teachers will gain valuable experience in integrating technology with their content and pedagogical knowledge. Therefore, TPACK training workshops and the development of online materials should be integrated into teacher training programmes.

Another implication is that EFL teacher education program requires to focus on the applicable use of technology because if using and understanding technology is inadequate, this is a key barrier to its classroom acceptance (Mirzajani et al., 2015). With the education program that pre-service teachers are offered, they get to know a number of technological tools, however, the main problem is that they are not knowledgeable enough to adapt, contextualize and integrate these tools into their teachings. Furthermore, teacher education programs apart from offering courses should also supply the pre-service teachers the chance of turning into the designers of

technologically dependent materials and practicing technology-assisted instruction with the implementation of these materials at practicum schools. In other words, as Niess (2008) expresses, “no matter how marvelous the coursework is in providing them with knowledge about teaching with technology, they must have opportunities to apply this knowledge” (p. 246). For this reason, blending coursework with fieldwork is crucial (İşler & Yıldırım, 2018). Instead of practicing in the field only in their last year, pre-service EFL teachers can start their school experience in their earlier years. Overall, by possessing adequate familiarity and skills for integrating technology, the teachers will have higher levels of self-assurance and interest allowing them to implement technology more in their classroom teachings.

The last implication would be about in-service teacher training, in other words, professional development. Matherson et al. (2014) indicate that in order to deal with the drawbacks that affect technology use in the classroom, teachers must be provided with extensive professional development opportunities which are included in the classroom and school practices, continued over a period of time, and involve opportunities for reflection. Professional development is a must in developing teacher quality and must go beyond the teachers' just learning new material and skills to having them figure out how to integrate those materials and skills into their teachings for an efficient contribution to student learning (National Staff Development Council, 2001). However, Keller et al. (2008) indicated that all professional development opportunities are not equally efficient. Common one-time teacher training workshops and conferences do not have a continuous effect on teachers' practice (Carlson & Gadio, 2002; Enochsson & Rizza, 2009). Instead of them, continuous training is required (Sardone & Devlin-Scherer, 2008). It is also pointed out by Lawless and Pellegrino (2007) that high-quality professional development must last a more lengthy period, support access to new technologies for teaching and involve the teachers entirely in meaningful activities with their specific contexts.

5.3 Conclusions

The present study aimed to find out how the informal technology use frequency of in-service EFL instructors predicts their TPACK levels. Together with this aim, the study also uncovered comprehensive information about in-service EFL

instructors' informal technology usage situations. For instance, the results of the study revealed that in-service EFL instructors mostly spent time on the Internet between 1 and 3 hours and they mostly use the technological devices of smartphones and personal computers daily.

The results of the study also indicated that in-service EFL instructors had a high level of TPACK and they were more competent in content knowledge than any other six components of TPACK. This means that the participants consider themselves efficient in their content area, which is the English language. It was also found out that in-service EFL instructors' informal technology use frequency takes place between 'once or twice a month' and 'once or twice a week'. Lastly, regression analysis indicated that informal technology use moderately predicts TPACK-EFL and they display a significant relationship but not much of the change in TPACK-EFL is explained by informal technology use.

Consequently, this study was important for being one of the few studies that employ the TPACK-EFL scale which is specifically designed for English language field. TPACK-EFL scale is very comprehensive and has not been employed a lot for in-service EFL instructors in the literature. Another importance of the study is relating informal technology usage situations with TPACK for in-service EFL instructors for the first time in this field.

5.4 Recommendations

The current study has several recommendations for further research. Firstly, the adopted methodology in this research study was only quantitative as it was considered to be enough to attain the results for the distinct aim of it. In further studies, including also qualitative methods specifically, interviews would be a better idea in order to comprehend the reasons behind the instructors' not integrating technology effectively in the classroom while using informal technology in their personal lives.

Furthermore, different scales can be used with this research study as there exist several other TPACK scales that are entirely different from the one used in this study. Additionally, in-service EFL instructors' formal technology practices can also be investigated and a comparison of a formal and informal technology use situation

and its relationship with TPACK can be studied. Alternately, the current research study can be conducted with a different focus group which is pre-service EFL teachers or a study comparing pre-service and in-service EFL teachers' situations can be applied adopting the same or different framework and scales.



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APPENDICES

A. TPACK and Formal/Informal technology use Questionnaire

Sayın katılımcı,

Bu yaptığım çalışmanın amacı siz öğretim görevlilerinin teknolojik pedagojik alan bilgisini (TPAB) ve sınıf dışında (günlük hayatta)ve sınıf içinde teknolojiyi ne ölçüde kullandığınız arasındaki ilişkiyi incelemektir. TPAB, teknolojinin eğitime entegrasyonunun öğretmen üzerindeki yeterliliğinin adıdır. Bu anket üç bölümden oluşmaktadır ve yaklaşık 7 dk sürmektedir. Anketin ilk bölümünde kişisel bilgilerinizin belirlenmesi için maddeler vardır, ikinci bölümünde 39 maddeden oluşan “Teknolojik Pedagojik Alan Bilgisi-Yabancı dil olarak İngilizce(TPAB-YDOİ) ölçeği” ve üçüncü bölümde ise sınıf dışında (günlük hayatta) ve sınıf içinde teknolojiyi kullanma sıklığı ölçeği bulunmaktadır.

Anketteki maddelere vereceğiniz samimi cevaplar, araştırmamın geçerlilik ve güvenilirliğini olumlu yönde etkileyeceğinden çok önemlidir. Katılımınız gönüllülük esasına dayalıdır. Vereceğiniz cevaplarınız gizli tutulacak ve sadece araştırmacı tarafından değerlendirilecektir, elde edilecek veriler bilimsel yayınlarda kullanılacaktır.

Çalışmanın sonuçlarını öğrenmek veya araştırma hakkında daha fazla bilgi almak isterseniz aşağıdaki iletişim adresini kullanarak araştırmacıya ulaşabilirsiniz. Araştırmaya katıldığınız ve sabırla tüm soruları cevapladığınız için teşekkür ederim. Anketin bitiminde ilgili hocalarla interview görüşmesi yapılacaktır, eğer ilgiliyseniz ve yardımcı olmak isterseniz lütfen aşağıdaki bilgilerden iletişim kurun.

Öğr. Gör. Büşra YILDIZ

byildiz@hho.edu.tr

Milli Savunma Üniversitesi - Yabancı Diller Yüksek Okulu

Bahçeşehir Üniversitesi - İngiliz Dili Eğitimi

PART I

Demographic Information

1. Lütfen cinsiyetinizi belirtiniz*

- ☐ Kadın
- ☐ Erkek

2. Lütfen yaşınızı belirtiniz*

3. Lütfen çalıştığınız üniversite türünü belirtiniz*

- ☐ Devlet
- ☐ Vakıf

4. Öğretmenlik tecrübeniz ne kadardır? *

- ☐ 0-1 yıl
- ☐ 2-5 yıl
- ☐ 6-10 yıl
- ☐ 11-15 yıl
- ☐ 16-20 yıl
- ☐ 21+

5. Lisans derecenizi aldığınız bölümü seçiniz*

- ☐ İngilizce öğretmenliği
- ☐ Mütercim-Tercümanlık
- ☐ Dilbilim
- ☐ İngiliz dili ve edebiyatı
- ☐ Amerikan kültürü ve edebiyatı

6. Aşağıdaki teknolojik aletlerden hangisini günlük olarak kişisel hayatınızda kullanırsınız? *

- ☐ Kişisel bilgisayar
- ☐ Tablet
- ☐ Akıllı telefon

- ☐Akıllı saat
- ☐Oyun konsolu
- ☐Diğer

7. Okul dışında günlük internet kullanım sürenizi belirtiniz*

- ☐ Günde 1 saatten az
- ☐ Günde 1-3 saat arası
- ☐ Günde 4-6 saat arası
- ☐ Günde 6 saat veya daha fazla

PART II

TPACK-EFL Survey

	Hiç uygun değil	Çok az uygun	Biraz uygun	Oldukça uygun	Çok uygun				
1. Temel teknoloji terimlerini (işletim sistemi, hard disk, kablosuz ağ, sanal bellek, vb.) doğru bir şekilde kullanabilirim.	1	2	3	4	5	6	7	8	9
2. Program kurmak ve internet bağlantısı kurmak gibi ayarları yapabilirim.	1	2	3	4	5	6	7	8	9
3. Bilgisayar çevre birimlerini (yazıcı, mikrofon, projeksiyon, vb.) kullanabilirim.	1	2	3	4	5	6	7	8	9
4. Olağan teknolojik sorunları (yazıcıdan çıktı alamama, internet bağlantısının kesilmesi, vb.) kendim çözebilirim.	1	2	3	4	5	6	7	8	9

	Hiç uygun değil									Çok az uygun									Biraz uygun									Oldukça uygun									Çok uygun								
5.	Projektör, tepegöz ve akıllı tahta gibi dijital sınıf ekipmanlarımı kullanabilirim.																																												
6.	Ofis uygulamalarını (Word, PowerPoint, vb.) ileri düzeyde kullanabilirim.																																												
7.	Metin, resim, ses, video ve animasyon gibi bilgi kaynaklarımı kullanarak çoklu ortam (video, web sitesi, vb.) oluşturabilirim.																																												
8.	İşbirliği yapılabilecek sanal ortamları (wiki, edmodo, 3B sanal ortamlar, vb.) amaçlarım doğrultusunda kullanabilirim.																																												
9.	Amacıma uygun olabilecek programları ve dijital araçları kullanmayı öğrenebilirim.																																												
10.	Duygu ve düşüncelerimi İngilizce konuşarak ifade edebilirim.																																												
11.	Duygu ve düşüncelerimi İngilizce yazarak ifade edebilirim.																																												
12.	İngilizce yazılmış bir metni telaffuz kurallarına uyarak okuyabilirim.																																												
13.	İngilizce yazılmış bir metinde ifade edileni anlayabilirim.																																												
14.	Ana dili İngilizce olan birini rahatlıkla anlayabilirim.																																												

	Öğrencilerin öğrenmelerini desteklemek için öğretmenlerin kullanabileceği yöntem ve teknikler								
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	Öğrencilerin öğrenmelerini desteklemek için öğretmenlerin kullanabilece								

	Öğretmenlerin Bilişim Teknolojilerini Kullanma Durumları								
	Hiç uygun değil		Çok az uygun		Biraz uygun		Oldukça uygun		Çok uygun
25. Öğrencilerin İngilizce dil seviyelerine göre var olan ders planını uyarlayabilirim.	1	2	3	4	5	6	7	8	9
26. Farklı konularla ilgili bilgi ve düşüncelerimi çoklu ortamlardan (video, slayt gösterisi, vb.) yararlanarak İngilizce ifade edebilirim.	1	2	3	4	5	6	7	8	9
27. Çok uluslu toplulukların yer aldığı ortamlara uzaktan katkıda bulunabilmek için bilişim teknolojilerinden (Web konferans yazılımı, vb.) yararlanabilirim.	1	2	3	4	5	6	7	8	9
28. Yabancı uyruklu kişilerle sanal ortamlar (second life, wiki, vb.) aracılığı ile ortak çalışma yürütebilirim.	1	2	3	4	5	6	7	8	9
29. Öğrencilerin bireysel öğrenme ihtiyaçlarına öğretim teknolojilerini kullanarak yanıt verebilirim.	1	2	3	4	5	6	7	8	9
30. Öğrencilerin yasal, etik, telif hakkına saygılı ve güvenli bir şekilde bilişim teknolojilerini kullanabilmeleri için onlara rehberlik edebilirim.	1	2	3	4	5	6	7	8	9
31. Öğretim teknolojilerini (sanal tartışma ortamları gibi) kullanarak öğrencilerin üst düzey düşünme becerilerini geliştirmelerini destekleyebilirim.	1	2	3	4	5	6	7	8	9
32. Derslerimde öğretim teknolojilerini kullanırken sınıf yönetimine hâkim olabilirim.	1	2	3	4	5	6	7	8	9
33. Hangi kazanımları bilişim teknolojilerinden yararlanarak vereceğime karar verebilirim.	1	2	3	4	5	6	7	8	9
34. Bilişim teknolojilerini kullanarak öğrencilerin öğrenimlerini destekleyecek materyal geliştirebilirim.	1	2	3	4	5	6	7	8	9

	Hiç uygun değil	Çok az uygun	Biraz uygun	Oldukça uygun	Çok uygun				
35. Öğrencilerin öğrenimlerini desteklemek amacıyla video, web sitesi gibi çoklu ortamlardan yararlanabilirim.	1	2	3	4	5	6	7	8	9
36. Öğrencilerin İngilizce öğrenmelerini desteklemek için sanal işbirliği ortamlarından (wiki, 3B sanal ortamlar, vb.) yararlanabilirim.	1	2	3	4	5	6	7	8	9
37. Öğrencilerin Bilişim teknolojilerini kullanarak (eğitim yazılımları vb.) kendi başlarına dil becerilerini geliştirmelerini destekleyebilirim.	1	2	3	4	5	6	7	8	9
38. Web 2.0 araçlarını (animasyon, dijital hikâye araçları, vb.) öğrencilerin dil becerilerini geliştirmek için kullanabilirim.	1	2	3	4	5	6	7	8	9
39. İngilizce öğretim sürecini sürekli iyileştirmek için dijital araç ve kaynaklardan yararlanarak mesleki gelişimimi destekleyebilirim.	1	2	3	4	5	6	7	8	9

PART III

Formal/Informal Technology Use Survey

4. Overall, how often do you use the following technology OUTSIDE of SCHOOL (e.g. at home, library, bus, friend's house)?

	1	2	3	4	5
1=Never					
2=Once a year	☹		☺		☺
3=Once or twice a month					
4=Once or twice a week					
5=Almost every day					
4-1. Computer installed Word processing tool (e.g. Word, Pages)	☐	☐	☐	☐	☐
4-2. Computer installed Spreadsheet tool (e.g. Excel)	☐	☐	☐	☐	☐
4-3. Computer installed presentation tool (e.g. Power Point, Keynote)	☐	☐	☐	☐	☐
4-4. Google does	☐	☐	☐	☐	☐
4-5. Maps (e.g. Google Map, MapQuest)	☐	☐	☐	☐	☐
4-6. Google Earth	☐	☐	☐	☐	☐
4-7. Social networking tool (Facebook, MySpace)	☐	☐	☐	☐	☐
4-8. Blog	☐	☐	☐	☐	☐
4-9. Youtube	☐	☐	☐	☐	☐
4-10. Second Life/OpenSim	☐	☐	☐	☐	☐
4-11. Web editing tool (Google Site)	☐	☐	☐	☐	☐
4-12. Movie production tool (iMovie, MovieMaker)	☐	☐	☐	☐	☐
4-13. Instant messengers or video conferencing tools (e.g. Skype, Facetime, MSN)	☐	☐	☐	☐	☐
4-14. Text messages (cellphone text, text messaging apps)	☐	☐	☐	☐	☐
4-15. Web search engines (e.g. Google, Yahoo, Bing)	☐	☐	☐	☐	☐

B. Participants' Answers to the Items of TPACK-EFL Survey

	Hiç uygun değil		2,0		Çok az uygun		4,0		Biraz uygun		6,0		Oldukça uygun		8,0		Çok uygun		Ortalama
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	
1. Temel teknoloji terimlerini (işletim sistemi,hard disk, kablosuz ağ, sanal bellek, vb.)doğru bir şekilde kullanabilirim.	1	1,0	0	0,0	1	1,0	1	1,0	10	9,5	4	3,8	28	26,7	8	7,6	52	49,5	7,71
2. Program kurmak ve internet bağlantısı kurmak gibi ayarları yapabiliyorum.	4	3,8	0	0,0	5	4,8	1	1,0	12	11,4	7	6,7	22	21,0	9	8,6	45	42,9	7,20
3. Bilgisayar çevre birimlerini (yazıcı,mikrofon, projeksiyon, vb.) kullanabilirim.	0	,0	0	0,0	1	1,0	1	1,0	7	6,7	2	1,9	24	22,9	9	8,6	61	58,1	8,03
4. Olağan teknolojik sorunları (yazıcıdan çıktı alamama, internet bağlantısının kesilmesi,vb.) kendim çözebilirim.	1	1,0	0	0,0	4	3,8	0	,0	15	14,3	6	5,7	32	30,5	10	9,5	37	35,2	7,25
5. Projektör, tepegöz ve akıllı tahta gibi dijital sınıf ekipmanlarını kullanabilirim.	0	,0	0	0,0	0	,0	0	,0	8	7,6	2	1,9	22	21,0	10	9,5	63	60,0	8,12
6. Ofis uygulamalarını (Word, PowerPoint,vb.) ileri düzeyde kullanabilirim.	0	,0	0	0,0	0	,0	1	1,0	11	10,5	4	3,8	27	25,7	12	11,4	50	47,6	7,79
7. Metin, resim, ses, video ve animasyon gibi bilgi kaynaklarını kullanarak çoklu ortam(video, web sitesi, vb.) oluşturabilirim.	2	1,9	1	1,0	7	6,7	2	1,9	22	21,0	11	10,5	27	25,7	8	7,6	25	23,8	6,54
8. İşbirliği yapılabilecek sanal ortamları (wiki,edmodo, 3B sanal ortamlar, vb.) amaçlarım doğrultusunda kullanabilirim.	6	5,7	2	1,9	7	6,7	1	1,0	17	16,2	10	9,5	31	29,5	9	8,6	22	21,0	6,35
9. Amacıma uygun olabilecek programları ve dijital araçları kullanmayı öğrenebilirim.	0	,0	0	0,0	0	,0	0	,0	9	8,6	4	3,8	23	21,9	9	8,6	60	57,1	8,02
10. Duygu ve düşüncelerimi İngilizce konuşarak ifade edebilirim.	0	,0	0	0,0	0	,0	0	,0	1	1,0	3	2,9	8	7,6	8	7,6	85	81,0	8,65
11. Duygu ve düşüncelerimi İngilizce yazarak ifade edebilirim.	0	,0	0	0,0	0	,0	0	,0	1	1,0	2	1,9	8	7,6	7	6,7	87	82,9	8,69
12. İngilizce yazılmış bir metni telaffuz kurallarına uyarak	0	,0	0	0,0	0	,0	0	,0	1	1,0	1	1,0	7	6,7	12	11,4	84	80,0	8,69

okuyabilirim.

13. İngilizce yazılmış bir metinde ifade edileni anlayabilirim.	0	,0	0	0,0	0	,0	0	,0	3	2,9	1	1,0	7	6,7	5	4,8	89	84,8	8,68
14. Ana dili İngilizce olan birini rahatlıkla anlayabilirim.	0	,0	0	0,0	1	1,0	0	,0	0	0,0	1	1,0	12	11,4	19	18,1	72	68,6	8,50
15. Öğrenme ortamına uygun öğretim yöntem ve teknikleri kullanabilirim.	0	,0	0	0,0	0	,0	0	,0	1	1,0	1	1,0	26	24,8	21	20,0	56	53,3	8,24
16. Öğrencilerin gelişim düzeylerine uygun öğrenme ortamları hazırlayabilirim.	0	,0	0	0,0	0	,0	0	,0	4	3,8	2	1,9	35	33,3	21	20,0	43	41,0	7,92
17. Öğrencilerin öğrenmelerini bedensel, zihinsel, duygusal, sosyal ve kültürel farklılıklarına uygun bir şekilde destekleyebilirim.	1	1,0	0	0,0	0	,0	0	,0	7	6,7	6	5,7	39	37,1	17	16,2	35	33,3	7,58
18. Öğrencilerin öğrenmelerini desteklemek amacıyla okul paydaşları (öğrenci, veli, öğretmenler, vb.) ile işbirliği yapabilirim.	1	1,0	0	0,0	2	1,9	0	,0	11	10,5	6	5,7	34	32,4	13	12,4	38	36,2	7,45
19. Mesleki gelişimim ile ilgili çalışmalarımın edindiğim deneyimi öğretim sürecine yansıtabilirim.	0	,0	0	0,0	0	,0	0	,0	2	1,9	3	2,9	31	29,5	16	15,2	53	50,5	8,10
20. Öğrencilerin kendi başlarına öğrenmelerini desteklemek amacıyla ders dışında da öğrenmeye güdülebilirim.	0	,0	0	0,0	0	,0	0	,0	9	8,6	6	5,7	35	33,3	10	9,5	45	42,9	7,72
21. Ders esnasında sınıf yönetimine hâkim olabilirim.	0	,0	0	0,0	2	1,9	0	,0	3	2,9	4	3,8	23	21,9	19	18,1	54	51,4	8,04
22. Öğrencilerin öğrenme süreçlerini değerlendirebilirim.	0	,0	0	0,0	1	1,0	0	,0	3	2,9	5	4,8	34	32,4	11	10,5	51	48,6	7,93
23. Öğrencilerin İngilizce dil becerilerini geliştirmelerini, uygun pedagojik yöntem ve teknikler kullanarak destekleyebilirim.	0	,0	0	0,0	1	1,0	0	,0	3	2,9	2	1,9	37	35,2	20	19,0	42	40,0	7,88
24. Öğrencilerin dil becerilerini geliştirecek nitelikte müfredata uygun etkinlikler hazırlayabilirim.	0	,0	0	0,0	1	1,0	0	,0	5	4,8	2	1,9	35	33,3	9	8,6	53	50,5	7,94
25. Öğrencilerin İngilizce dil seviyelerine göre var olan ders planını uyarlayabilirim.	0	,0	0	0,0	1	1,0	0	,0	3	2,9	4	3,8	34	32,4	9	8,6	54	51,4	7,98
26. Farklı konularla	0	,0	0	0,0	0	,0	0	,0	1	1,0	0	0,0	23	21,9	16	15,2	65	61,9	8,37

İlgili bilgi ve düşüncelerimi çoklu ortamlardan (video,slayt gösterisi, vb.) yararlanarak İngilizce ifade edebilirim.																				
27. Çok uluslu toplulukların yer aldığı ortamlara uzaktan katkıda bulunabilmek için bilişim teknolojilerinden (Web konferans yazılımı, vb.) yararlanabilirim.	3	2,9	0	0,0	5	4,8	2	1,9	16	15,2	4	3,8	31	29,5	11	10,5	33	31,4	6,97	
28. Yabancı uyruklu kişilerle sanal ortamlar(second life, wiki, vb.) aracılığı ile ortak çalışma yürütebilirim.	5	4,8	0	0,0	7	6,7	1	1,0	19	18,1	7	6,7	28	26,7	10	9,5	28	26,7	6,62	
29. Öğrencilerin bireysel öğrenme ihtiyaçlarına öğretim teknolojilerini kullanarak yanıt verebilirim.	0	,0	0	0,0	1	1,0	1	1,0	3	2,9	6	5,7	36	34,3	22	21,0	36	34,3	7,71	
30. Öğrencilerin yasal, etik, telif hakkına saygılı ve güvenli bir şekilde bilişim teknolojilerini kullanabilmeleri için onlara rehberlik edebilirim.	1	1,0	1	1,0	4	3,8	1	1,0	9	8,6	8	7,6	30	28,6	15	14,3	36	34,3	7,30	
31. Öğretim teknolojilerini (sanal tartışma ortamları gibi) kullanarak öğrencilerin üst düzey düşünme becerilerini geliştirmelerini destekleyebilirim.	0	,0	0	0,0	5	4,8	0	,0	14	13,3	9	8,6	40	38,1	11	10,5	26	24,8	7,06	
32. Derslerimde öğretim teknolojilerini kullanarak sınıf yönetimine hâkim olabilirim.	0	,0	0	0,0	2	1,9	0	,0	5	4,8	6	5,7	32	30,5	16	15,2	44	41,9	7,76	
33. Hangi kazanımları bilişim teknolojilerinden yararlanarak vereceğime karar verebilirim.	0	,0	0	0,0	1	1,0	0	,0	11	10,5	6	5,7	36	34,3	17	16,2	34	32,4	7,50	
34. Bilişim teknolojilerini kullanarak öğrencilerin öğrenimlerini destekleyecek materyal geliştirebilirim.	0	,0	0	0,0	1	1,0	2	1,9	13	12,4	3	2,9	34	32,4	13	12,4	39	37,1	7,50	
35. Öğrencilerin öğrenimlerini desteklemek amacıyla video, web sitesi gibi çoklu ortamlardan yararlanabilirim.	0	,0	0	0,0	0	,0	1	1,0	4	3,8	4	3,8	38	36,2	13	12,4	45	42,9	7,84	

36. Öğrencilerin İngilizce öğrenmelerini desteklemek için sanal işbirliği ortamlarından (wiki, 3B sanal ortamlar,vb.) yararlanabilirim.	2	1,9	2	1,9	3	2,9	2	1,9	21	20,0	10	9,5	29	27,6	10	9,5	26	24,8	6,71
37. Öğrencilerin Bilişim teknolojilerini kullanarak (eğitim yazılımları vb.) kendi başlarına dil becerilerini geliştirmelerini destekleyebilirim.	1	1,0	0	0,0	0	,0	2	1,9	16	15,2	7	6,7	36	34,3	11	10,5	32	30,5	7,23
38. Web 2.0 araçlarını (animasyon, dijital hikâye araçları, vb.) öğrencilerin dil becerilerini geliştirmek için kullanabilirim.	1	1,0	0	0,0	5	4,8	3	2,9	14	13,3	7	6,7	28	26,7	11	10,5	36	34,3	7,12
39. İngilizce öğretim sürecini sürekli iyileştirmek için dijital araç ve kaynaklardan yararlanarak mesleki gelişimimi destekleyebilirim.	0	,0	0	0,0	1	1,0	0	,0	2	1,9	6	5,7	37	35,2	13	12,4	46	43,8	7,87

C. Permissions to Use the Scales



Re: TPACK-EFL anketi kullanımı hk.

25 Kasım 2019 16:22

Kimden: "deryabaser" <deryabaser@ibu.edu.tr>

Kime: "Büşra YILDIZ" <byildiz@hho.edu.tr>

Merhaba,

Anketi çalışmanızda aşağıdaki çalışmaya atıfta bulunarak kullanabilirsiniz.

Developing a technological pedagogical content knowledge (TPACK) assessment for preservice teachers learning to teach English as a foreign language

D Baser, TJ Kopcha, MY Ozden - Computer Assisted Language Learning, 2016

İyi çalışmalar,

Dr. Derya Başer
BAİBÜ-BÖTE

Kimden: "Büşra YILDIZ" <byildiz@hho.edu.tr>

Kime: "deryabaser" <deryabaser@ibu.edu.tr>, "derya yasar" <derya.yasar@gmail.com>

Gönderilenler: 25 Kasım Pazartesi 2019 16:03:07

Konu: TPACK-EFL anketi kullanımı hk.

Sayın hocam merhabalar,

Ben Hava Harp Okulunda görev yapmakta olan Öğr. Gör. Büşra YILDIZ. Yüksek lisans tezim için öğretim görevlilerinin TPACK levelleri ve günlük hayatta teknoloji kullanımları arasındaki ilişkiyi araştırmaya karar verdim. Bununla ilgili araştırma yaparken sizin geliştirmiş olduğunuz TPACK-EFL anketine denk geldim. Müsaadenizle, yüksek lisans tezimde anketinizi kullanabilir miyim?

Saygılarımla,

Inst. Büşra YILDIZ
Foreign Languages Education Department
Air Force Academy/National Defense University
0 212 663 24 90



about outside classroom technology use survey

24 Haziran 2019 11:50

Kimden: "Büşra YILDIZ" <byildiz@hho.edu.tr>

Kime: "skwang" <skwang@nyit.edu> "hhsu02" <hhsu02@nyit.edu>

Dear professor,

My name is Büşra YILDIZ and I am currently working at Turkish Air Force Academy as an English language instructor. While I was doing some research about my MA thesis which is about the relationship between English language instructors' TPACK knowledge and outside classroom technology use, I have encountered your survey. May I use your survey in my thesis with your permission?

Wang, S. K., Hsu, H. Y., Campbell, T., Coster, D. C., & Longhurst, M. (2014). An investigation of middle school science teachers and students use of technology inside and outside of classrooms: considering whether digital natives are more technology savvy than their teachers. *Educational Technology Research and Development*, 62(6), 637-662.

Best regards,

Inst. Büşra YILDIZ
Foreign Languages Education Department
Air Force Academy/National Defense University
0 212 663 24 90

D. Curriculum Vitae

PERSONAL INFORMATION

Surname, Name: Yıldız, Büşra

Nationality: Turkish (T.C.)

Date and Place of Birth: 27 June 1995, İstanbul

Marital Status: Single

E-mail: yildizbusra.yldz@gmail.com

EDUCATION

Degree	Institution	Year of Graduation
MA	Bahçeşehir University	2020
BA	Yıldız Technical University	2016
High School	Dede Korkut Anatolian High School	2012

WORK EXPERIENCE

Year	Place	Enrollment
2016	Yıldız Technical University	Instructor
2017- ...	National Defense University	Instructor

FOREIGN LANGUAGES

Advanced English, Basic Spanish

CERTIFICATES

Mayflower College (Teachers of Aviation English Course)	London/ENGLAND
Bogazici University (THE Conference 2019, Towards Higher Education)	İstanbul/TURKEY
Yıldız Technical University (YTU 1st International ELT	İstanbul/TURKEY

Conference, SHIFTING PARADIGMS AND MINDS:

The Implications of Innovations in ELT)

HOBBIES

Pilates, Travelling

