HACETTEPE ÜNİVERSİTESİ
EĞİTİM BİLİMLERİ ENSTİTÜSÜ

Department of Foreign Languages Education

English Language Teaching Program

INVESTIGATION OF THE RELATIONSHIP BETWEEN PRE-SERVICE EFL TEACHERS' TPACK AND TEACHING MOTIVATION

Reyyan Zülal YÖNEY

Ph.D. Dissertation

Ankara, 2024

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İNGİLİZCE ÖĞRETMENİ ADAYLARININ TPAB VE ÖĞRETME MOTİVASYONLARI ARASINDAKİ İLİŞKİNİN İNCELENMESİ

Reyyan Zülal YÖNEY

Ph.D. Dissertation

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Acceptance and Approval

To the Graduate School of Educational Sciences,

This thesis / dissertation, prepared by **REYYAN ZÜLAL YÖNEY** and entitled “Title of the Thesis” has been approved as a thesis for the Degree of **Ph.D.** in the **Program of Program of English Language Education** in the **Department of Foreign Language Education** by the members of the Examining Committee.

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Prof. Dr. İsmail Hakkı MİRİCİ

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Abstract

This study aimed to reveal the relationship between technological pedagogical content knowledge (TPACK) and teaching motivation of fourth year students studying in Teaching English as a Foreign Language (EFL) programs in Türkiye in order to reveal whether and how the two phenomena are related to each other. The study also aimed to explore the perceptions of pre-service EFL teachers and academics regarding the TPACK and teaching motivation of pre-service EFL teachers. The participants in the study consisted of 4th year students in the EFL programs of sixteen state universities in seven geographical regions of Türkiye and academics working in these departments. Participants were determined through the stratified sampling method. 377 fourth-year EFL students and 9 academics took part in the study. The study followed a mixed-method research design. The findings of the study indicated that pre-service EFL teachers' TPACK and motivation to teach had a positive correlation. While they had minimal predictive power over each other, the impact of motivation to teach over TPACK was statistically higher than the impact of TPACK over motivation to teach. The perceptions of pre-service teachers and academics also indicated a relation between TPACK and motivation to teach. The study revealed the TPACK and teaching motivation levels of pre-service teachers as well as the perceptions of pre-service teachers and academics on these. The study also provided pedagogical implications on the development of EFL teacher education programs as well as the TPACK and teaching motivation of pre-service EFL teachers.

Keywords: TPACK, motivation to teach, teacher training, English as a foreign language

Öz

Bu çalışmanın amacı, Türkiye'de İngilizce Öğretmenliği programlarında öğrenim gören dördüncü sınıf öğrencilerinin teknolojik pedagojik alan bilgisi (TPAB) ve öğretim motivasyonu arasındaki ilişkiyi ortaya koymak ve bu iki olgunun birbiriyle ilişkili olup olmadığını ve nasıl ilişkili olduğunu açığa çıkarmaktır. Çalışma ayrıca, öğretmen adaylarının TPAB ve öğretme motivasyonuna ilişkin olarak İngilizce öğretmen adaylarının ve akademisyenlerin algılarını ortaya koymayı amaçlamıştır. Çalışmanın katılımcıları, Türkiye'nin yedi coğrafi bölgesindeki on altı devlet üniversitesinin İngilizce öğretmenliği programlarındaki 4. sınıf öğrencilerinden ve bu bölümlerde çalışan akademisyenlerden oluşmaktadır. Katılımcılar tabakalı örnekleme yöntemi ile belirlenmiştir. Çalışmaya 377 İngilizce Öğretmenliği dördüncü sınıf öğrencisi ve 9 akademisyen katılmıştır. Çalışmada karma yöntem araştırma deseni izlenmiştir. Çalışmanın bulguları, İngilizce öğretmen adaylarının TPAB ve öğretme motivasyonunun pozitif bir korelasyona sahip olduğunu göstermiştir. Birbirleri üzerinde minimum yordama gücüne sahip olsalar da öğretme motivasyonunun TPAB üzerindeki etkisi TPAB'ın öğretme motivasyonu üzerindeki etkisinden istatistiksel olarak daha yüksektir. Öğretmen adayları ve akademisyenlerin algıları da TPAB ile öğretme motivasyonu arasında bir ilişki olduğunu göstermiştir. Çalışma öğretmen adaylarının TPAB ve öğretim motivasyonu düzeylerinin yanı sıra öğretmen adaylarının ve akademisyenlerin bunlara ilişkin algılarını da ortaya koymuştur. Çalışma ayrıca, EFL öğretmen eğitimi programlarının geliştirilmesinin yanı sıra EFL öğretmen adaylarının TPAB ve öğretim motivasyonu üzerine pedagojik çıkarımlar sunmaktadır.

Anahtar sözcükler: TPAB, öğretme motivasyonu, öğretmen eğitimi, İngilizce Öğretmenliği

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Symbols and Abbreviations

EFL: English as a foreign language

ELT: English Language Teaching

PCK: pedagogical content knowledge

TPCK: technology, pedagogy and content knowledge

TPACK: technological pedagogical content knowledge

Chapter 1

Introduction

This chapter begins by providing a statement of the problem in relation to the study, which is followed by the aim and significance of the study. Then, the assumptions and limitations of the study are presented. Finally, the definitions in relation to the key terms, phrases and acronyms are provided in this section.

Statement of the Problem

The rapid advancement of technology brought about a different take on the knowledge bases of the individuals in a diverse array of professional sectors. This is also true for the knowledge base of teacher candidates as well as in-service teachers and teacher educators. This change in the understanding of the necessary components that the knowledge base of a teacher should include has influenced the requirements of a teacher candidate who is expected to become a member of the teaching community upon graduation. The paradigm shift in the understanding of teacher knowledge is not limited to the knowledge base of teachers in terms of technology but also in terms of their knowledge in relation to pedagogy and content. Thus, the complex structure of knowledge that technological pedagogical content knowledge constitutes holds an important place in the qualifications of pre-service teachers for them to effectively become part of the teaching force.

Motivation constitutes one of the primary traits of one's personality that determines the likelihood of pursuing a career or carrying out a role in a specific field. This notion applies to the field of the teaching profession. The motivation of individuals who are candidates to become professional in any given field of work is just as important as the motivation of the individuals who are part of the profession. The motivation of pre-service teachers is important in that their future careers as educators depend on many factors involving their motivation. Motivation to teach, in this aspect, is a specific facet of the construct of

motivation, which is specifically about the motivation in relation to the act of teaching and the teaching profession.

Technological pedagogical content knowledge is significant for the reorganization of teacher education (Baran & Canbazoğlu Bilici, 2015). This places it as a commonly investigated research subject. Although technological pedagogical content knowledge (TPACK) of teachers has been investigated in many contexts, the investigation of this factor in relation to teachers' motivation to teach has been limited. In terms of pre-service teacher education, the impact relation between English as a Foreign Language (EFL) teachers' technological pedagogical content knowledge (TPACK) and their motivation to teach has not been extensively investigated in Turkish pre-service teacher education contexts in relation to fourth-year pre-service EFL teachers, which constitutes a gap in the literature on pre-service teacher education, TPACK, and teaching motivation.

Looking into their technological pedagogical content knowledge in the final year of their pre-service teacher education is important in terms of determining the status quo of pre-service teachers who are about to graduate and who are expected to become part of the teaching force of the country in the following teaching terms. Investigating pre-service teachers' TPACK in relation to their motivation to teach is necessary for the purpose of finding the gaps in their knowledge bases as well as their motivation levels.

Aim and Significance of the Study

Teachers constitute the most fundamental element in an education system and the successful operation of any education system is dependent on the attributes and qualities of teachers (Gök & Atalay Kabasakal, 2019). Considering the fact that teachers assume such a critical role in the overall efficiency of the educational system they are a part of, it is essential to investigate the knowledge bases and teaching motivations of pre-service teachers who are about to begin their professional careers in the field of education so that

informed predictions can be made about their abilities to adequately fulfill the requirements of their role in the education system in which they will soon be involved.

There is a crucial role that teachers play in influencing the motivation of their students through their own enthusiasm and dedication, which are essential components that can affect students' participation and engagement in learning (Dörnyei, 1998; Ghenghesh, 2013). In light of this substantial influence, it is necessary to pay regard to the knowledge bases and motivation dispositions of teachers in relation to teaching and the teaching profession since these can have a profound effect on their overall pedagogical effectiveness as well as their professional productivity. The significance of understanding teachers' knowledge bases in relation to technology, pedagogy, and content and the various factors impacting their motivation to teach need to be taken seriously and not neglected by educational institutions and policymakers who are actively involved in the ongoing enhancement of the educational system as well as the education and development of teachers.

In order to achieve effective teaching, teachers require pedagogic and content knowledge together (Shulman, 1986) and TPACK framework is significant for research as it has an important place in how teacher education is restructured (Baran & Canbazoğlu Bilici, 2015). On the other hand, motivation is one of the affective factors involved in language teaching as in all teaching professions. Motivation of pre-service teachers is significant for research in that "teacher motivations are influential from the outset of their entry to teacher education, are formed and fashioned through the course of their teacher education studies and continue to play out across their teaching careers" (Watt & Richardson, 2008a, p. 407). It constitutes one of the elements that determines appeal towards teaching (Sinclair, 2008).

Teacher education research plays an important role in how teaching and teacher education practices can be improved. In the context of equipping students for a future that is technologically advanced, the facilitation of pre-service teachers' acquisition of

technological pedagogical content knowledge (TPACK) has emerged as a critical focus within pre-service teacher education (Lachner et al., 2021). Schmidt et al. (2009) stated that utilizing TPACK for evaluating teacher knowledge may impact teacher training and professional development and that it is necessary to continually reconsider implementations in teacher education for introducing strategies preparing teachers for effective technology integration into their teaching (p. 125-126). In a similar vein, the teaching motivation of pre-service teachers during their teacher education process plays a crucial role in determining the likelihood of pre-service teachers' effectiveness in the profession. Thus, investigating the relation between two essential factors such as pre-service teachers' TPACK and their motivation to teach can provide important insights into how teacher education and teacher performance may be improved.

In light of this stated importance of TPACK and motivation to teach, the aim of this study is to investigate the relationship between the TPACK levels and teaching motivation of pre-service EFL teachers in Turkish universities in order to reveal whether and how the two phenomena are related to each other. Pre-service teachers are expected to have adequate technological pedagogical content knowledge when they complete their pre-service teacher education. In addition to this, their motivation to teach is an essential factor that impacts their teaching practices in their profession. The investigation of pre-service teachers' TPACK and motivation to teach has the potential to assist teacher education institutions in the improvement of pre-service teacher training in order to foster their development.

Another aspect of the importance of this study is with regards to its focus on 4th-year pre-service EFL teachers. The 4th-year pre-service teachers in Turkish faculties of education participate in systematic classroom observation as well as teaching practice, which are referred to as practicum courses. These courses are integrated into their curricula during the final two semesters of their pre-service teacher education, which afford them hands-on experience and foster their engagement with the teaching profession that they do

not have the opportunity to experience in the initial three years of their training and which may significantly influence their perspectives regarding the teaching profession as well as impacting their motivation and technological pedagogical content knowledge. Thus, investigating the TPACK and teaching motivation of 4th-year pre-service EFL teachers can possibly yield critical insights into the conditions and status quo of teacher candidates who are anticipated to transition into the EFL teaching community immediately following their graduation.

Research Questions

The present study aimed to investigate the relation between pre-service EFL teachers' TPACK and motivation to teach as well as the perceptions of them and of the academics in EFL departments in relation to pre-service EFL teachers' TPACK and motivation to this. In light of this, the research questions that this study aimed to answer were as follows:

Main Research Question

1. What is the relation between pre-service EFL teachers' TPACK and their motivation to teach?

Sub Research Questions

2. What is pre-service EFL teachers' level of motivation to teach?

3. What is pre-service EFL teachers' level of technological pedagogical content knowledge (TPACK)?

4. What are the views of pre-service EFL teachers regarding their TPACK and their motivation to teach?

5. What are the views of the academics in EFL departments about their students' TPACK and their motivation to teach?

Assumptions

In this study, it is assumed that:

1. The sample chosen for the collection of the data is representative of the population.

2. The responses that the pre-service teachers give to the scale items will be sincere.

3. The pre-service teachers and academics participating in the semi-structured interviews will give sincere responses to the questions.

4. The analysis methods adopted for this study are ideal for analyzing the data from the scales and semi-structured interviews used in this study.

5. The data collection tools in the study are reliable and valid enough for this study.

6. The pre-service teachers and academics participate in the research voluntarily since they all have signed consent forms.

Limitations

One limitation of this study was that the results to be obtained from the participants in this research are based on the participants' self-reported declarations in the data collection process through scales and semi-structured interviews. This meant that the results obtained were limited to the declarations made by the participants and that any interpretation of the data was based on these self-reports.

Another limitation of the study was that most pre-service EFL teachers were not expected to be familiar with the term technological pedagogical content knowledge (TPACK) prior to the study. This did not constitute a problem for the data to be collected through the scales as the pre-service teachers were not expected to provide responses based on their understanding of this term and there were not any scale items that involved the term technological pedagogical content knowledge. However, they were expected to answer some questions during the semi-structured interviews in relation to their technological pedagogical content knowledge. In order to overcome this problem, the

researcher provided an approximately ten-minutes long presentation that explained the term technological pedagogical content knowledge, its components, its usage, and the term motivation to teach.

Finally, the study intended to look into the 4th-year pre-service EFL teachers' TPACK and motivation to teach in a manner that could facilitate the generalizability of the results to the whole 4th-year pre-service EFL teachers in Türkiye. However, the distribution of the universities with EFL departments revealed that the majority of the geographical regions did not involve any private universities with EFL departments. Thus, the study's scope was limited to public universities as the stratified sampling method was more applicable through limiting the scope to one category of universities. Another reason for opting for leaving out private universities was that the curriculum design and instruction in public universities were believed to be similar to each other compared to private universities.

Definitions

Important terminologies used in this thesis are defined in this section.

Technological pedagogical content knowledge (TPACK): Refers to the technological pedagogical and content knowledge in relation to teachers and pre-service teachers. The basis of this term was introduced by Shulman (1986) in the ''pedagogical content knowledge" framework and was expanded by Mishra and Koehler (2006) through the integration of technological knowledge into their framework. In terms of the use of the acronym TPCK in the sub-scale of the EFL-TPACK scale by Wang (2022) and TPACK, the former refers to the "the synthesized knowledge base" (p. 9937) of technology, pedagogy and content whereas the latter is described as the overall teacher knowledge that includes the component knowledge bases (Wang, 2022).

Pedagogical content knowledge: Refers to the unique professional knowledge of teachers that is formed through a combination of content and pedagogy (Shulman, 1987).

Pedagogical content knowledge involves the representation and adaptation of subject matter for teaching (Koehler et al., 2017).

Motivation to teach: Refers to the motivation that teachers, teacher candidates, and pre-service teachers have for the act of teaching and for the teaching profession.

Intrinsic motivation: Refers to the pursuit of an activity for the enjoyment of the action itself rather than any external source of gratification (Ryan and Deci, 2000).

Extrinsic motivation: Refers to the pursuit of an activity with the purpose of achieving a result separable from the activity itself (Ryan and Deci, 2000).

Chapter 2

Theoretical Basis of Research and Literature Review

This chapter is going to provide the theoretical basis of research and literature review in relation to technological pedagogical content knowledge and motivation to teach.

Technological Pedagogical Content Knowledge (TPACK)

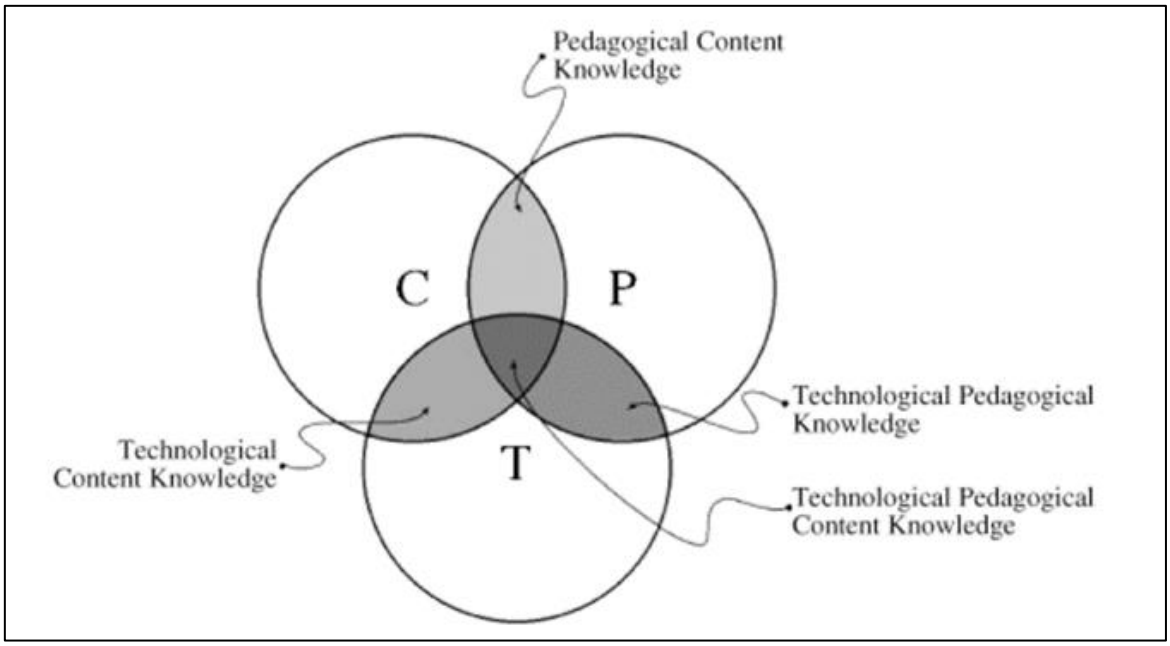
The origins of the modern technological pedagogical content knowledge framework can be traced back to Shulman's (1986) 'pedagogical content knowledge'. Shulman's concept of pedagogical content knowledge emphasized that successful teaching necessitates a thorough and extensive grasp of not only the subject being taught (content knowledge) but also the most efficient methods for imparting that content (pedagogical knowledge). Shulman criticized the dichotomy of content and pedagogy, questioning the idea that pedagogy should be considered as secondary (Shulman, 1986). His stance on pedagogical content knowledge related content knowledge to teaching and teachability (Shulman, 1986; 1987). He expressed that it was another type of content knowledge (Shulman, 1986, p. 9). Pedagogical content knowledge refers to "that special amalgam of content and pedagogy that is uniquely the province of teachers, their own special form of professional understanding" (Shulman, 1987, p. 9), which is in and on itself regarded as one of the core competences of teachers in terms of knowledge and understanding of their field of expertise (European Commission, 2013).

Shulman's concept laid the foundation for further exploration and development of the TPACK framework. The TPACK framework expands upon Shulman's concept by adding the dimension of technology knowledge to the equation (Mishra & Koehler, 2006; Koehler & Mishra, 2008; Koehler & Mishra, 2009). Shulman's (1986) framework was expanded by Mishra and Koehler (2006), who integrated technological knowledge into their framework (Figure 1) through a design experiment that focused on teachers' use of technology in teaching. The TPCK framework is based on the understanding of teaching as a practice

that requires a combination of different types of knowledge (Mishra & Koehler, 2006). However, the TPACK framework not only stresses the importance of the three components of technology, pedagogy, and content on their own but also highlights the complex interplay among these components. Technological pedagogical content knowledge is defined as “an emergent form of knowledge that goes beyond all three components” (Mishra & Koehler, 2006, p. 1028).

Figure 1

The TPCK Model



Reprinted from “Technological pedagogical content knowledge: A framework for teacher knowledge,” by P. Mishra, & M. J. Koehler, 2006, The Teachers College Record, 108(6), 1017–1054. Copyright 2006 by Teachers College, Columbia University.

As is seen in the framework, technology, pedagogy and content form the three basic components of TPACK. Based on the intersections of these three basic components, different knowledge types emerge within the framework, which are named as pedagogical content knowledge, technological pedagogical knowledge, technological content

knowledge, and technological pedagogical content knowledge, which is at the center of the framework.

The component of content knowledge (CK) in the TPACK framework refers to the knowledge of the subject knowledge itself (Koehler & Mishra, 2005), which, in the case of EFL, corresponds to the knowledge of the English language itself. Pedagogical knowledge (PK) component of the framework entails knowledge in relation to the practices, processes, and methods of both teaching and learning (Mishra & Koehler, 2006; Koehler & Mishra, 2008; 2009). Technological knowledge (TK), on the other hand, is harder to define unlike the other two basic components of the framework and more elusive as it is in a constant state of change (Koehler & Mishra, 2008; 2009). It refers to the knowledge of standard and advanced technologies as well as the knowledge of operating these technologies (Mishra & Koehler, 2006).

In terms of the knowledge types that emerge at the intersections of the basic components, technological content knowledge (TCK) involves the reciprocal relationship between technology and content that necessitates teachers to have the knowledge of the subject matter as well as the knowledge of how subject matter can be transformed by using technology (Mishra & Koehler, 2006). Technological pedagogical knowledge (TPK) refers to the knowledge of transformation of teaching and learning by the use of technology in specific manners (Koehler & Mishra, 2008; 2009). Pedagogical content knowledge, similar to Shulman's (1986) model, is described as the knowledge of pedagogy with regards to its application to the teaching of particular content (Mishra & Koehler, 2006; Koehler & Mishra, 2008; 2009).

Technological pedagogical content knowledge (TPACK) forms the central component of the framework through the accumulation of the types of knowledge that are described above. Technological pedagogical content knowledge involves the interaction of the central components of the framework while diverging from the independent knowledge

of the components (Koehler & Mishra, 2008). It is the central, comprehensive component of the framework where all the other components intersect (Kabakci Yurdakul et al., 2012).

The TPACK framework has emerged as a techno-pedagogical integration, which is based on pedagogical considerations and involves the practical implementation of both pedagogical and technological factors in the technology integration process into education (Kabakci Yurdakul et al., 2012). The framework recognizes that in order to effectively teach with technology, teachers must possess not only content knowledge and pedagogical knowledge, but also a deep understanding of how to integrate technology into their teaching practices (Mishra & Koehler, 2006). TPACK has been utilized more and more to characterize the knowledge teachers require for successful technology integration into their teaching (Schmidt et al., 2009). As the presence of technology use is ever-expanding within classrooms, frameworks such as TPACK are necessary in order to underpin teachers' expertise of technology use in education (Baser et al., 2016).

Assessment of TPACK

One line of research regarding assessment of TPACK involves the endeavors in instrument development for measuring competence regarding the domains of the framework. TPACK as a construct is a comprehensive concept in nature. Thus, it does not come as a surprise that assessment of TPACK has been a central subject within the field of TPACK research. Assessment or measurement of TPACK has been attempted with a variety of data collection tools while scale and survey tools predominantly constitute the tools developed for this purpose. The development of such tools requires extensive trial and error processes as the elements of such instruments need testing and reviewing in order to be classified as effective and correct mediums for assessment. In the scope of the research on developing measurement tools for TPACK, various instruments intended to measure the TPACK of in-service as well as pre-service teachers. Assessment tools for measuring teachers' TPACK have been utilized to investigate the competence and needs of teachers.

One of the primary methods used for measuring teachers' TPACK is the self-assessment instruments that reveal teachers' perceived TPACK competences.

Among these assessment tool development studies, some concentrated on developing a self-assessment instrument for teachers in order to measure TPACK holistically. For instance, Kabakci Yurdakul et al. (2012) developed the TPACK-deep scale for the purpose of measuring pre-service teachers' overall TPACK with a focus on the central component, TPCK, of the TPACK model. Other studies involved assessment tools that included sub-sections with items on the specific domains of the TPACK model alongside the central TPACK domain (Schmidt et al., 2009; Canbazoğlu Bilici et al., 2013; Pamuk et al., 2015; Akyuz, 2018; Bostancıoğlu & Handley, 2018; Kaplon-Schilis & Lyublinskaya, 2020; Prasojo et al., 2020).

The self-assessment tools designed for assessing the TPACK of pre-service teachers include instruments developed to measure the TPACK of pre-service teachers without differentiating their fields of education (Kabakci Yurdakul et al., 2012; Pamuk et al., 2015) as well as instruments aiming to measure the TPACK of pre-service teachers majoring in specific disciplines (Schmidt et al., 2009; Canbazoğlu Bilici et al., 2013; Baser et al., 2016; Akyuz, 2018; Kaplon-Schilis & Lyublinskaya, 2020; Wang, 2022).

Some assessment tools that were developed for measuring TPACK were specifically designed for measuring TPACK in relation to EFL. One of the prominent examples of such assessment tools is the self-assessment survey tool develop by Baser et al. (2016). Their TPACK-EFL tool had survey items on all sub-sections of the TPACK model and was designed to be used with pre-service EFL teachers with subject specific survey items on language teaching. Similarly, Bostancıoğlu and Handley (2018) developed the EFL Total PACKage questionnaire, which is a self-report tool with items on the distinct domains of the TPACK model that aimed at measuring EFL teachers' TPACK. Prasojo et al. (2020) also developed a survey tool that was specifically designed for the assessment of EFL teachers' TPACK with items on the domains of the model. Likewise, The EFL-TPACK scale

developed by Wang (2022) focuses on the TPACK levels of EFL in-service and pre-service teachers in line with the requirements of the 21st century competences. However, this two-dimensional scale has sub-sections for pedagogical content knowledge and technological pedagogical content knowledge dimensions in order to assess and provide an understanding of technology integration of teachers into their teaching.

Among the self-assessment tools developed for measuring teachers' TPACK, Akyuz (2018) designed a performance assessment instrument supported by a self-assessment tool. This format was unlike many other studies on instrument development for pre-service teachers' TPACK assessment as it enabled the comparison of two different assessment instruments. Apart from self-assessment, other assessment tools employing various methods have been developed in order to measure teachers' TPACK. Tseng (2016) developed one such tool which aims to investigate student perspectives regarding their perception of their teachers' TPACK. This study suggested that students' perceptions may shed light on the practice of teachers regarding technology integration and may enhance the understanding of their TPACK.

The review of literature showed that TPACK assessment tools that are discipline specific as well as interdisciplinary (applicable to different fields of teaching) exist in the field. These assessment tools are designed to measure the knowledge requirements and knowledge needs of teachers in relation to their technological pedagogical content knowledge. The specialized assessments tools designed for TPACK provide not only researchers but also teacher educators with opportunities for more comprehensive understanding of teachers' technological, pedagogical, and content knowledge within the context of their chosen teaching fields, which, in turn, can inform teacher education.

TPACK in Foreign Language Teaching

Advancements within the domain of educational technology have stimulated investigations concerning Technological Pedagogical and Content Knowledge (Çelik &

Mirici, 2024). Scholarly research into technological pedagogical content knowledge in the field of language education has predominantly focused its efforts and attention on foreign language instruction and foreign language teachers. Though studies on teachers' TPACK in native language teaching exist, they are limited in number within the literature. The review of literature revealed only one study directly exploring the TPACK of native language teachers. In this study, Cheng (2017) explored the perceptions of native language teachers' TPACK in Taiwan with a focus on the native language of Hakka. On the other hand, the majority of the related literature on language teaching and TPACK focused on foreign or second language teaching when investigating language teachers' TPACK.

Within literature, TPACK of foreign language teachers have been investigated in various contexts. Bustamente and Moeller (2013) carried out a case study on an online professional development program using Web 2.0 technologies for teachers of German as a foreign language adopting the TPACK model as a theoretical framework in order to foster technology literacy and expand German language proficiency among other objectives. Tseng et al. (2016) explored Mandarin as a foreign language teachers' TPACK development in their study that aimed to support teachers' TPACK in relation to web conferencing teaching. In another study, Bustamente (2020) investigated the TPACK-based professional development on Web 2.0 based technologies in her study involving Spanish as a foreign language teachers in the United States. Likewise, Li and Tseng (2022) conducted a study involving the TPACK of foreign language teachers participating in a training course on robot-assisted language learning in a Chinese as a second language context in Taiwan. Qiu et al. (2022) investigated TPACK with a focus on pre-service teachers of Chinese as a second language in China.

While TPACK of foreign language teachers have been investigated in a variety of language contexts, English language teachers' TPACK has received substantial attention in the related literature (Cheng, 2017; Qiu et al., 2022). One of the primary incentives for the exploration of TPACK in EFL settings more extensively can be stated as the fact that

English has become a lingua franca (Seidlhofer, 2001; 2005), adopted as a crucial medium of instruction across a wide variety of teaching settings where it is accepted as a foreign language. The review of literature revealed that research on the TPACK of EFL teachers has been explored in contexts involving in-service teachers as well as pre-service teachers. A substantial number of these studies have tended to show special interest towards TPACK of teachers in terms of their self-efficacy in technology use, their beliefs and perceptions regarding their TPACK levels or the development of their TPACK over time. Other studies have focused on measuring the technological pedagogical content knowledge of teachers and teacher candidates.

Technology use and technology integration abilities of teachers have been a notable part of research on TPACK in foreign language teaching, which have received increasing attention within the current literature. In their mixed-method research study, Liu and Kleinsasser (2015) looked into six EFL high school teachers' perceptions of their computer-assisted language learning knowledge as well as their TPACK development in a year-long professional development program. The study reported that all EFL teachers involved in the study demonstrated improvement in their survey results, as well as in the interviews conducted towards the end of the study, regarding their self-efficacy for technology integration compared to their self-efficacy prior to their participation in the technology-enhanced professional development program in which they received training on computer-assisted language learning. This study also reported that the EFL teachers' improvement and participation also had positive impacts on their students' learning experiences. In a more comprehensive study involving 150 teachers, Yang (2018) looked into the TPACK and technology integration self-efficacy through a quantitative research design. The study concluded that, though the EFL teachers had moderate self-efficacy in technology integration, their technological knowledge as well as their confidence in technology integration were not sufficient. On the other hand, Yang (2018) also stated that TPACK and technology integration self-efficacy were positively related, with TPACK having substantial

impact over the latter. It was signified that teachers need to continually improve their knowledge base in order to promote technology integration into teaching.

Lai et al. (2022) investigated EFL teachers' technology use in relation to TPACK as well as school culture, teacher beliefs, and professional development. Analyzing the survey results of 280 EFL teachers, they explore EFL teachers' technology use for content delivery, for learning enrichment, and for transformation in education towards students' self-directed learning. The study put forth two important impacts of TPACK. It was found that TPACK functioned as a direct predictor of the aforementioned three forms of technology use of teachers as well as a mediating factor for facilitating the impacts of school culture and professional development. The study also revealed stronger predictive power for TPACK in relation to teachers' technology use for learning enrichment and for transformation, which entails student involvement to a greater extent, compared to technology use for content delivery, which is more teacher centered. Through a qualitative research design, Zhang and Fang (2022) investigated the TPACK and teacher efficacy of 12 university EFL teachers in relation to their implementation of technology-integrated flipped classrooms. With its formulation of flipped classroom-situated TPACK, this study illustrated a novel understanding of TPACK that can enhance our understanding of teaching with technology-integrated flipped classroom by incorporating elements such as the teachers' viewpoints and convictions of TPACK constructs as well as the pedagogical design of flipped classrooms (p. 12). Raygan and Moradkhani (2022) looked into the interaction of school climate, attitudes, and TPACK with technology integration success of 209 EFL teachers. Their study reported that technology integration was substantially predicted by the TPACK and attitudes of EFL teachers in a direct and positive manner. The study suggested that teachers may perceive themselves as more equipped and assured regarding the utilization of digital technologies when they possess literacy in technology use.

Teachers' own perceptions on their own TPACK levels have been another aspect of the research on TPACK. Nazari et al. (2019) looked into the difference in the perceived

TPACK of novice and experienced EFL teachers with a purpose to uncover the impact of the difference in their perceptions on their professional development. Their research indicated that novice and experienced teachers opted for different training courses on professional development in relation to their own needs regarding their technological pedagogical content knowledge. The study of Huang et al. (2022) on the TPACK of Chinese EFL teachers revealed that teachers' perceptions in relation to their TPACK was that they generally perceived themselves as competent in TPACK, with their content knowledge being the area where they were most confident based on the results.

The development of EFL teachers' TPACK and their competencies in technology use and technology has been another field of research in relation to TPACK in foreign language teaching. In one such study on the exploration of the development of language teachers' computer-assisted language learning (CALL) competency, Tai (2015) reported that teachers demonstrated development in their competencies in technology use and in their technology integration into their teaching due to the result of the impact of a teacher education workshop specifically designed for CALL. Cindrić and Gregurić (2019) carried out an action research study on technology integration in pre-service English language teacher education. The results of their study indicated that technology integration into pre-service teacher education can be successful through careful planning and that pre-service teachers' awareness on technology integration improved through the intervention process carried out in this study. Chen et al.'s (2022) study involved college EFL teachers' TPACK in China during online teaching of English. Their study revealed that teachers' TPACK development is a dynamic cognitive process and that their TPACK developed through situating the learning process in interactive activity systems.

As the review of literature has revealed, the TPACK of foreign language teachers in different contexts has been investigated with studies on EFL teachers forming a prominent field of investigation within the research on foreign language teachers' TPACK. Research on EFL teachers' TPACK focused on a variety of aspects of EFL teachers' as well as EFL

pre-service teachers' TPACK. These aspects involved measuring TPACK, self-efficacy of teachers in technology use and technology integration, their beliefs and perceptions in relation to their TPACK and the development of TPACK in in-service and pre-service EFL teachers. TPACK of pre-service EFL teachers in Turkish contexts has also received significant attention from researchers in this field.

Research on Pre-Service EFL Teachers' TPACK in Türkiye

TPACK research in Turkish contexts have been carried out involving in-service as well as pre-service teachers of a variety of subject fields. In-service teachers' TPACK exploration involved aspects of teachers' knowledge such as the relationship between their TPACK and technology integration (Çelik, 2022; Dikmen & Demirer, 2022), their TPACK development (Canbazoğlu Bilici & Baran, 2015), and the practical implementation of their TPACK knowledge (Yapıcı & Mirici, 2023). Likewise, pre-service teachers of different subject fields have been studied in terms of their TPACK competency and technology use or technology integration (Kabakçı Yurdakul, 2011; 2018; Pamuk, 2012; Kabakci Yurdakul, & Coklar, 2014; Keser et al., 2015; Çelik et al., 2016) along with the development of their TPACK (Kartal & Dilek, 2021). In relation to EFL, technological pedagogical content knowledge of pre-service EFL teachers in Turkish contexts have also been investigated with a focus on different aspects of their knowledge bases.

Pre-service teachers' competence in TPACK is one of the main focuses of research on pre-service EFL teachers and TPACK in the Turkish contexts. Solak and Çakır (2014) investigated pre-service EFL teachers' TPACK competency levels in relation to the factors of gender and academic achievement in a public university with 137 pre-service EFL teachers. They found that TPACK and academic achievement were not significantly correlated while the technological knowledge and pedagogical knowledge levels differed between males and females. Pre-service teachers' content and technology knowledge were found to be at medium level in their study. Öz (2015) also looked into the TPACK of pre-service EFL teachers in a public university for the purpose of assessing their knowledge.

He concluded that pre-service teachers had high levels of TPACK competence while female pre-service teachers were revealed to have higher TPACK development. Atar et al.'s (2019) investigation involved 182 pre-service EFL teachers in two public universities whose technopedagogical content knowledge levels were investigated by taking into account a variety of variables. Their investigation indicated that pre-service teachers' TPACK level was high in general. Another finding of their study was that the variables involved (grade, gender, daily use of internet and social media) did not have a significant effect on their general TPACK. In their study, Sarıçoban et al. (2019) investigated pre-service EFL teachers' TPACK levels by exploring all sub-components of their technological pedagogical content knowledge. The results of their study indicated pre-service EFL teachers' competence in TPACK was satisfactory with their levels of competence being moderate to high, while there was room for development. Farhadi and Göktürk's (2023) investigation of pre-service EFL teachers' TPACK not only focused on their competence levels but also their TPACK needs. Their findings also indicated high levels of TPACK competence in pre-service EFL teachers. In terms of the TPACK needs of pre-service teachers, they concluded that the needs were mostly on the technology related knowledge bases of pre-service teachers.

In her exceptional research study, Turgut (2017a) explored the TPACK of pre-service EFL teachers in a public university in comparison with the TPACK of in-service EFL teachers and teacher candidates in the formation program of their department. The study reported a significant difference among the levels of technological pedagogical content knowledge of the three groups of teachers in terms of all domains of the model with the exception of the TPACK sub-domain. In terms of technology knowledge, pedagogy knowledge, content knowledge, and technological pedagogical knowledge, teacher candidates in the formation programs and pre-service teachers were found to have higher self-efficacy compared to in-service teachers. The findings from the qualitative data of the

study also indicated that pre-service teachers' TPACK was more sophisticated compared to that of candidate and in-service teachers.

The TPACK competence of pre-service EFL teachers was explored through pre-service teachers' lesson planning and lesson implementation practices as well. In their study on pre-service EFL teachers' TPACK in relation to their technology integration into their lesson planning and their implementations, Kurt et al. (2014) implemented a course that was designed for the study. Pre-service teachers' lesson planning process was followed through the course and their lesson implementations were observed. The results of the study indicated that pre-service teachers endeavored to enhance the quality of their teaching through effective integration of technology, taking into account the relationship between content, pedagogy and technology.

When the studies in the above literature review that investigated the TPACK levels of pre-service EFL teachers are taken into consideration, it was observed that the findings of the studies indicate pre-service EFL teachers to have either high or moderate levels of technological pedagogical knowledge, though they may or may not have varying levels of competence in different aspects of their TPACK. These studies involved senior students as well as pre-service teachers in their earlier years of teacher education in their undergraduate programs. Based on the related literature, the pre-service EFL teachers in Turkish EFL teacher education contexts are considered to be generally competent in technological pedagogical content knowledge.

The development of pre-service teachers' TPACK is another field of research within EFL studies in Turkish contexts. The development of pre-service EFL teachers' TPACK through the process of the compulsory computer-assisted language learning course in the EFL department of a Turkish university by Koçoğlu (2009). Her study showed that the computer-assisted language learning course facilitated pre-service EFL teachers' TPACK development and enabled them to practice their TPACK. The findings of the study also pointed out the impact of pre-service teachers' instructors on inspiring them to integrate

technology through modeling the use of technology in class. Similarly, Kurt et al. (2013) looked into the development of pre-service EFL teachers' TPACK development in a 12-week study in which pre-service teachers received theoretical instruction as well as conducting hands-on practice. Their study revealed that pre-service teachers' scores in several domains of their TPACK showed significant increase at the end of the study. Turgut's (2017b) study on the perceived development of TPACK involved sophomore, junior, and senior pre-service EFL teachers. Her study showed that the development of TPACK over time demonstrated a nonlinear pattern.

Self-confidence and beliefs about TPACK have been investigated in relation to pre-service EFL teachers in Turkish contexts as well. Sancar-Tokmak and Yanpar-Yelken (2015) investigated pre-service EFL teachers' TPACK self-confidence with regards to the impact of creating digital stories in their experimental research. Their investigation revealed that pre-service EFL teachers' TPACK self-confidence in their TPACK demonstrated significant difference before and after creating digital stories. Likewise, İşler and Yıldırım (2018) explored pre-service EFL teachers' perceptions of their TPACK as well as the factors that influence their perceptions. They concluded that pre-service teachers' perceptions of their TPACK were high. In terms of the factors that influence TPACK, they reported that pre-service teachers stressed the place of factors such as their interest and experience as well as highlighting the support they received from their instructors regarding their TPACK development.

The review of the literature indicated that pre-service EFL teachers' TPACK has been investigated with a focus on different aspects and different parameters not only in Türkiye but also in international contexts within the existing literature. The research executed in this area has investigated the TPACK competence levels presented by pre-service EFL teachers. The primary aim of the current study is to further explore the TPACK of pre-service EFL teachers by investigating their TPACK in relation to their motivation to

teach with a special focus on 4th-year pre-service EFL teachers in teacher education programs at Turkish universities.

Theories of Motivation

Motivation plays an important role in education as in different fields since it is "the driving force behind all actions performed" (Ghenghesh, 2013, p. 457). Schunk and DiBenedetto (2020) articulated that motivation concerns processes that initiate goal-directed activities and that these processes are factors that result in outcomes including achievement and environmental regulation (p. 1). A variety of theories regarding the nature and structure of motivation have appeared in the last century, which provide diverse definitions regarding motivation and its components. Among the essential theories on motivation, the primary and prominent ones could be listed as attribution theory (Weiner, 1985; 1986), expectancy-value theory (Eccles et al., 1983; Wigfield & Eccles, 2000), social cognitive theory (Bandura, 1986; 1989), achievement goal theory (Nicholls, 1984; Dweck, 1986; Elliot & McGregor, 2001), and self-determination theory (Deci & Ryan, 1985; 2000; Deci et al., 1991).

The origins of attribution theory can be traced back to the 1950s and 1960s (Harvey & Weary, 1984; Weiner, 1995). Though it was primarily adopted into the study of psychology (Weiner, 1995), attribution theory has been shown to be a valuable conceptual framework for research into motivation in pedagogical contexts (Graham, 1991). Attribution theory centers upon the relation of causality, that is, the reasons behind the occurrence of a particular event and this attribution of responsibility are believed to shape the later behavior (Weiner, 1972). From the perspective of attribution theory, achievement motivation is observed to be a determinant of how success and failure is perceived in that individuals with high achievement motivation may attribute failure or success in attaining a goal to effort whereas individuals low in achievement motivation are more likely to attribute their failure or success in attaining a goal to ability (Weiner, 1972).

Expectancy-value theory has also been one of the prominent theories on motivation. The foundations of this theory are rooted in Atkinson's (1957) work (Wigfield, 1994; Loh, 2019). From the perspective of this theory, significant predictors of motivation to pursue achievement are regarded to be expectancy for success and the value attributed to succeeding (Wigfield, 1994). Other factors such as goals, self-schema, perceptions on the difficulty of tasks, and beliefs about ability influence the expectancies and values in relation to achievement (Wigfield & Eccles, 2000). Task values are argued to be subjective since tasks and task difficulty are perceived and valued differently by different individuals (Eccles & Wigfield, 2020). The value of a task is determined based on four main constructs, which are intrinsic value (also, interest value), utility value, attainment value, and cost (Eccles, 1984, as cited in Eccles & Wigfield, 2020). In the field of education, the expectancy-value theory is utilized for explaining and predicting not only learning performance but also persistence and ambitions of learners (Loh, 2019).

Social cognitive theory focuses on learning from social environment (Schunk & Usher, 2012). From a social cognitive point of view, behavior is believed to be influenced by the reciprocal interactions among personal, behavioral, and social/environmental factors (Schunk & Usher, 2012). Behavior is viewed to be motivated by self-regulative mechanisms, which include self-monitoring, judgment of one's behavior, affective self-reflection, and self-efficacy mechanisms (Bandura, 1991). The self-regulatory system and how it operates are believed to be impacted by social factors according to the social cognitive theory's interactionist perspective (Bandura, 1991). Motivation itself is also guided by the operations of self-regulatory mechanisms such as self-efficacy (Wood & Bandura, 1989). From earlier research to modern concepts involving agency, motivation has constituted a crucial place within the social cognitive theory and the vital role of motivation alongside social factors in shaping human behavior was highlighted even in the initial stances of social cognitive theory (Schunk & DiBenedetto, 2020).

Achievement goal theory emerged in the 1970s and became one of the prominent theoretical frameworks in the field of motivation research (Urdan & Kaplan, 2020). One of the prominent hypotheses that is frequently examined in research on achievement-goal theory is the connection between goal orientation and the learning strategies adopted for goal achievement (Wolters, 2004). Achievement goals, as represented by goal orientation, are not just simple target goals or more general goals, but rather a general orientation to the task which includes a number of related beliefs (Pintrich, 2000). Achievement goal theory especially concentrates on student motivation and asserts that the reasons and objectives that students have for engaging in academic tasks need to be taken into consideration in order to understand their motivation and their achievement-related behavior (Wolters, 2004; Zusho & Clayton, 2011). Harackiewicz et al. (2022) stated that it is probable that a variety of achievement goals could be more effective in particular contexts, while different achievement goals might be more effective for different people. Wolters (2004) articulated that the environment of a goal structure can potentially affect students' motivation as well as their cognitive engagement and their achievement.

As defined by Deci and Ryan (2008), self-determination theory is "an empirically based theory of human motivation, development, and wellness" (p. 182). Instead of focusing on the amount of motivation that individuals possess, self-determination theory focuses on different types of motivation (Deci & Ryan, 2008). This aspect of self-determination theory separates it from the majority of historical and contemporary frameworks focusing on human motivation which views motivation as a concept that is unitary (Ryan & Deci, 2022). A distinction between autonomous and controlled motivations is made in self-determination theory (Ryan & Deci, 2022). It is highlighted that autonomous motivation, which involves extrinsic motivation or well-internalized extrinsic motivation, allows people to exhibit higher levels of interest and excitement as well as vitality and confidence, which result in better performance (Ryan & Deci, 2017, as cited in Ryan & Deci, 2022). Ryan and Deci (2000) define intrinsic motivation as "doing an activity for the inherent satisfaction of the activity

itself" while they describe extrinsic motivation as "the performance of an activity in order to attain some separable outcome" (p. 71) through the perspective of self-determination theory (SDT). The importance of feeling a sense of freedom and independence is highlighted by self-determination theory as a vital element in fostering self-determined motivation (Legault et al., 2007). From the perspective of self-determination theory, the greater the internalization or sense of self-determination regarding a particular goal or value, the greater the consistency in behavior reflecting that goal or value (Legault et al., 2007).

Current theories on motivation provide extensive theoretical frameworks that can be utilized to address the inquiries with regards to the navigation of individuals through the intricacies as well as the incentives associated with the profession of teaching (Watt & Richardson, 2008a). The prominent theories in relation to motivation have not only shaped motivation but also informed research on motivation within the field of educational research (Koenka, 2020; Urhahne & Wijnia, 2023).

Motivation to Teach

The discipline concerned with the study of motivation within the field of education is a dynamic area of scientific enquiry which incorporates a variety of methodologies and conceptual frameworks transcending the limitations of conventional theoretical paradigms (Urhahne & Wijnia, 2023). Motivation has been acknowledged in the field of education as an important parameter and an expanding body of scholarly inquiry has denoted its effect on a myriad of different variables like the efficacy of teaching (Han & Yin, 2016). Research on teacher motivation especially started to expand towards the end of the 20th century and teaching motivation of initial teachers has been a focal research area, while in-service teachers' motivation to teach has also started receiving more attention in recent years (Han & Yin, 2016). The past several decades have witnessed research into the phenomenon of motivation within the field of education predominantly with regards to student motivation; however, simultaneously, there has been a lack of systematic and theoretically grounded

exploration into the motivational factors influencing teachers, though some attention has been directed towards this area of study (Richardson & Watt, 2010).

This neglected issue is a critical oversight considering the fact that teacher motivation has a profound impact on teachers' professional objectives, underlying beliefs, cognitive insights, personal ambitions, and corresponding actions, which therefore plays a crucial role in shaping not only the motivational levels of their students but also the overall learning outcomes achieved by those students (Richardson & Watt, 2010, p. 139). Within the research dedicated to understanding the various factors that affect teacher motivation, several aspects of the construct of motivation have been explored through empirical research. One area of inquiry that has appeared focuses specifically on the motivation that teachers have for the act of teaching and the teaching profession itself. When considered from the perspective of educational research, motivation constitutes one of the numerous interrelated elements that connect with the self-conceptual frameworks of in-service teachers as well as those of prospective teacher candidates.

Motivation to Teach and Pre-Service Teachers

Pre-service teachers' motivation to teach is of significance within the research on the exploration of motivation since a better understanding of the motivations of individuals in pursuing teaching as a profession is needed (Richardson & Watt, 2010). The understanding of motivation levels of pre-service teachers can reveal their forthcoming levels of engagement and overall effectiveness within the classroom environment (Watt & Richardson, 2008a). Sinclair (2008) expressed that motivation may be regarded as the attraction that draws individuals towards teaching and the teaching profession, while emphasizing that investigations into the motivational factors influencing pre-service teachers' aspirations to teach could yield valuable insights into the recruiting process of new teachers and support the sustained retention of these individuals within the teaching profession. The motivation that pre-service teachers have for the act of teaching and for

becoming a teacher has been explored and analyzed from the vantage points of a variety of theoretical frameworks involving motivation.

One prominent methodology in the exploration of motivation involved the FIT-Choice model (Watt & Richardson, 2007; Richardson & Watt, 2014). Richardson and Watt (2006) explored the teaching motivations and characteristics of pre-service teachers from different majors in three Australian universities. They adopted the FIT-Choice Scale developed by Watt & Richardson (2007), which is grounded in the expectancy-value theory. Their study revealed the profiles of pre-service teachers and indicated that the primary motivations of pre-service teachers for choosing teaching as a career included their perceived teaching abilities, the value of teaching and intrinsic factors such as the desire for making a social contribution. Watt et al. (2012) also adopted the FIT-Choice model in their research exploring pre-service teachers' motivations for choosing teaching as a career. They focused on pre-service teachers from different countries for an international comparison and reported that pre-service teachers' motivations for teaching showed similarities across different countries' contexts. Fokkens-Bruinsma and Canrinus's (2014) investigation using the same model focused on Dutch teacher education contexts. Their findings indicated that working with children and adolescents was among the top motivations of the pre-service teachers in the teacher education contexts involved in this study.

Another line of research focused on the source of pre-service teachers' motivation, investigating whether motivation was intrinsic, extrinsic, altruistic, or a combination of a variety of these different factors. Sinclair (2008) reported that pre-service teachers can be multi-motivated to become teachers. His study showed pre-service teachers' intrinsic motivations to outweigh their extrinsic motivations and reported that working with children and mental stimulation received the highest scores from pre-service teachers in terms of their intrinsic motivations. Bruinsma and Jansen's (2010) study on the intrinsic and extrinsic motivations of pre-service teachers with a focus on adaptive and maladaptive motives revealed that the intrinsic adaptive motives of pre-service teachers had connections to their

prior abilities, their teacher education program and their classroom teaching experiences. Similarly, Zhang et al. (2020) found pre-service teachers to have strong intrinsic values while their extrinsic values were weak. Though considerable scholarly inquiry has been conducted in the literature examining various forms of motivation, an absence of agreement persists within academic circles concerning the exact definitions and boundaries that separate the varieties of motivation (Richardson & Watt, 2010).

The development or change of motivation over time is not as well-known as the factors that initiate motivation to become teachers (Sinclair et al., 2006). With that said, research showed that pre-service teachers' motivation levels and motivation properties may fluctuate over time through their teacher education process (Yuan & Zhang, 2017). Pre-service teachers' motivation to teach has connections to their psychological wellbeing. Kaya and Çenesiz (2020) noted that pre-service teachers' psychological wellness was influenced by their motivation., with intrinsic motivation having predictive over their psychological wellbeing. With regards to teachers' self-conceptions, Kumazawa (2013) explored novice EFL teachers' teaching motivation through an interpretive inquiry, which revealed that teachers shaped their self-concepts as a result of self-reflection, resulting in teachers' regaining their motivation.

In the educational research conducted within Turkish contexts, the motivations of pre-service teachers have been the subject of investigation in a variety of scholarly studies that examine the factors influencing motivation, in addition to exploring the multifaceted dimensions that constitute motivation. Research on the variety of motivations possessed by pre-service teachers has demonstrated a collection of results that reveal the various factors that influence pre-service teachers' motivation to teach and to pursue a career in teaching (Yüce et al., 2013). Research into Turkish pre-service teachers' motivation has explored the dimensions of internal and external motivation along with the pre-service teachers' sources of motivation (Dereli & Acat, 2010).

Among the many factors that contribute to the construct of motivation, instructors constitute another factor that impacts pre-service teachers' motivation to teach. Instructors and the impact of instructors on the process of professional development is an element of the specific context of pre-service teacher education. Alpaslan et al.'s (2018) study on the impact of support and class belonging on the career motivation of pre-service teachers shed light on the influence that instructors have on pre-service teachers. Their study showed that the support pre-service teachers receive from their instructors during teacher education impacts their motivation. The support pre-service teachers received from their instructors was revealed to be the strongest predictor of motivation among the factors explored in this study (Alpaslan et al., 2018).

The experimental case study carried out by Çimen and Çakmak (202) explored pre-service teacher motivation in relation to the effect of feedback they received from their instructors as well as their peers. The study involved a feedback model that was designed to explore motivation and reflective thinking of pre-service teachers. Their study not only revealed a significant increase in pre-service teachers' motivation, but it also showed that pre-service teachers' personal development was positively influenced by the implementation of the model.

Some of these scholarly studies that focus on pre-service teachers and their motivations for teaching have explored the intricate relationship that exists between their motives to engage in the teaching profession and their attitudes and perceptions regarding the teaching vocation itself. (Ayık & Ataş, 2014; Gök & Atalay Kabasakal, 2019; Bas, 2022). Ayık and Ataş (2014) revealed that pre-service teachers' motivation to teach had a positive and moderate connection to their attitudes towards the profession itself. Pre-service teachers' self-efficacy in association with their motivation to teach has been another focus of research in this area, with the purpose of identifying the links that exist between the two phenomena. (Gök & Atalay Kabasakal, 2019; Bas, 2022). The research study conducted by Gök and Atalay Kabasakal (2019) revealed minimal correlation existing between the self-

efficacy beliefs held by pre-service teachers and their levels of motivation. Contrary to the findings of Gök and Atalay (2019), Bas (2022) argued that self-efficacy serves as a crucial intermediary variable that mediates the relationship of teaching motivation with beliefs on teaching and the attitude towards teaching.

Research on Pre-Service EFL Teachers' Motivation to Teach in Türkiye

Pre-service teachers' motivation for teaching has been explored in different Turkish pre-service teacher education contexts. Pre-service English as a Foreign Language teachers' motivation to teach is no exception to these attempts at exploring teaching motivations. Studies focusing on the motivation of pre-service EFL teachers in the Turkish context have uncovered a multitude of both intrinsic and extrinsic determinants that either foster or hinder the motivation to pursue a career in teaching.

Motivational orientations of pre-service EFL teachers in freshmen, junior, and senior classes was explored by Yütük (2018). He concluded that Turkish pre-service EFL teachers had intrinsic motivations more that extrinsic motivations. Adiguzel and Karagol (2022) ascertained that the elements exerting the most substantial influence on the motivation levels of pre-service teachers in regard to their teaching aspirations were predominantly related to the ability to shape the future trajectories of children and adolescents, make positive social contributions, and promote social equity (p. 85). In a similar vein, Cengiz (2023) articulated that societal factors, particularly those pertaining to social contribution and the enhancement of social equity, emerged as the most significant factors influencing the decision-making process of pre-service EFL teachers when selecting English language education as a career path. Yılmaz (2018) explored pre-service teachers' self-conceptions and revealed that pre-service teachers' self-beliefs had a considerable impact on the development of their self-concepts and that they were all motivated at the start of their practicum.

In terms of the degree of motivation and commitment demonstrated towards the profession of teaching, Başöz (2021) conducted an investigation into the career motivational

factors of pre-service EFL teachers enrolled in a Turkish state university and discovered that the levels of motivation exhibited by these individuals were found to be moderately high. In a separate research study, Cengiz (2023) documented the high motivation levels among pre-service EFL teachers attending another state university, thereby contributing further insights into this area of inquiry. While these studies reported on the motivational levels pertaining to teaching among pre-service EFL teachers, it is important to note that the scope of these studies were confined specifically to the individual institutions where the respective research was carried out.

Cengiz (2023) also highlighted that detailed research in EFL teacher education is needed for a deeper understanding of pre-service EFL teachers' motivation levels. Consequently, in order to achieve a more comprehensive and nuanced understanding of the motivational dynamics influencing pre-service EFL teachers' aspirations to pursue a career in education, research that encompasses a wider and more inclusive scope within the context of EFL teacher education in Türkiye arises as an essential necessity.

Teacher Identity

Teacher identity is a unique and multifaceted construct that involves and is affected by a variety of parameters. It is also dynamic in nature and comprises multiple identities (Akkerman & Meijer, 2011). Providing a definition for identity is one of the major struggles for the comprehension of identity (Beauchamp & Thomas, 2009; Reeves, 2018) and it is denoted to be a task rather difficult due to the impact of differing frameworks (Walkington, 2005). Although it is challenging to provide a clear and unambiguous description of teacher identity, Mayer (1999, as cited in Walkington, 2005) stated that a distinction between teacher identity and teachers' functional roles. The relationship between teacher education and identity is crucial as preservice teacher education programs have impact over pre-service teachers' perceptions as well as development in relation to teacher identity formation (Tunaz & Sarıçoban, 2023).

Motivation and commitment to teaching are considered to be among the most important elements that constitute the professional identity profile of EFL teachers (Ma, 2022). It has been posited that an indication of teachers' perception of their professional identity can be obtained through the analysis of factors such as teachers' self-efficacy, job satisfaction, motivation, and professional dedication in their interplay (Canrinus et al., 2012). Hanna et al. (2019) described motivation as one of the main domains of teacher identity, while Van Lankveld et al. (2017) listed “a sense of competence” and “a sense of commitment and feeling a deep personal interest” (p. 333) among the key indicators of teacher identity development. Canrinus et al. (2012) argued that motivation to be relevant to teachers' perceptions of their professional identity (p. 116). Li et al. (2022) highlighted the importance of the first year of teaching for the professional identity of beginning teachers and argued that pre-service teachers with high motivation and positive attitudes towards teaching would form a significant source of quality teachers. Considering the importance placed on motivation in relation to teacher identity and the argument on the crucial role of the first year of teaching for beginning teachers’ professional identity, exploration of motivation in relation to candidate teachers is also substantial.

In terms of the relationship between teachers’ professional identity and their knowledge bases, one dimension of teacher identities, with regards to language teachers, is described as being cognitive, which involves factors such as teachers’ beliefs and knowledge about content and pedagogy (Barkhuizen, 2017). Research on the relationship between knowledge and teacher identity posits a reciprocal relationship between the two constructs. In this regard, Philips (2017) reported that the implementation of technological pedagogical content knowledge is shaped by the processes involved in identity development. On the other hand, Feng and Kim (2023) put forward that the process pertaining to the development of teachers’ identities is inextricably linked to teacher learning and teacher knowledge.

Based on these views, motivation and knowledge could be acknowledged as forming two factors that are a part of the versatile nature of it, though it is hard to define what constitutes teacher identity. Looking at teacher identity from the perspective of the research explored in this section, technological pedagogical content knowledge and motivation to teach can be accepted as factors that contribute to teacher identity development in that the two phenomena relate to the competence base and commitment of teachers regarding the teaching profession.

Conclusion

This chapter presented a theoretical background for research in technological pedagogical content knowledge (TPACK). Then, the chapter provided a review of research on the assessment of TPACK with a focus on the assessment tools developed specifically for this purpose. Then, studies on TPACK in foreign language teaching were presented, which was followed by research on pre-service EFL teachers' TPACK within the context of Türkiye. Following these, the chapter also provided a theoretical background for research on motivation to teach. Next, the chapter provided a review of literature on the research on motivation to teach and pre-service teachers, followed by research on pre-service EFL teachers' motivation to teach within the context of Türkiye. The following chapter will present the methodology of the present study.

Chapter 3

Methodology

This chapter presents the details on the research design of the study, setting and participants, data collection instruments as well as the details of the data collection and data analysis processes.

Type of Research

The study followed a mixed-methods convergent parallel research design. Mixed methods research design is a research paradigm based on both quantitative and qualitative data collection and data analysis (Creswell, 1999; Dörnyei, 2007). There are several reasons for choosing this research design in this study. First of all, this method was chosen since both qualitative and quantitative data collection tools and data analysis procedures were wanted to be incorporated into this study. Another reason why this method was chosen was that it allows for the triangulation of data by bringing the findings of different data collection methods together (Creswell, 1999; Bryman, 2006a). Lastly, a mixed-method research design was adopted as this method can provide a more complete and comprehensive account of the research topic (Bryman, 2006b) since “combining more than one type of data source provides a fuller understanding of a research problem” (Guest & Fleming, 2015, p. 582). Mixed method research may follow a variety of research designs, one of which is convergent parallel design. In convergent parallel research design, the data collection and data analysis processes for qualitative and quantitative strands occur concurrently and each strand is prioritized in an equal manner, whereas comparing and relating the results occurs afterwards for interpretation (Creswell & Plano Clark, 2011).

The quantitative data collection tools used in the study were in the form of scales. The analysis of the quantitative data for the first research question was carried out through simple linear regression analysis. Regression analysis is a method of analysis used to model the relationship between two variables and predict the target variable (Chatterjee &

Simonoff, 2013, p. 4). As simple linear regression analysis requires one dependent and one independent variable, the two variables will each be positioned as independent and dependent variables in two consecutive regression analyses in order to reveal the impact relation of the two concepts. The analysis of the data for the second and third research questions were carried out through paired-samples t tests, one-way ANOVA test, and Kruskal Wallis test. Determining whether to use a parametric or non-parametric test for the analysis of these research questions was based on the outcomes of the normality analysis of the data and the variables to be analyzed for each research question.

The qualitative data collection tools used in the study consisted of group interviews and interviews, which utilized semi-structured interview questions. Semi-structured interview is one of the different types of interviews adopted in qualitative research. Semi-structured interviews involve a set of pre-prepared questions and guidance from the interviewer while following an open-ended format that provides opportunities to the interviewee to elaborate their responses (Dörnyei, 2007). The process of semi-structured interviews may emerge in a conversational manner, which also allows the interviewees to expand on their responses (Longhurst, 2003). The data analysis method used for qualitative data from the semi-structured interviews was thematic analysis. This method of analysis allows for the identification and analysis of themes in qualitative data (Braun & Clarke, 2006; Clarke & Braun, 2014). An inter-coder reliability analysis procedure was also carried out for the thematic analysis process. This method was utilized for the analysis of the qualitative data in the first, fourth, and fifth research questions. Through a combination of these two analysis methods, a better understanding of the data may be achieved. The details of the analysis process are provided in the data analysis section of this chapter.

Research Population and Participants

The setting and participants of this study was determined as 4th-year EFL students and academics in EFL departments of public universities in Türkiye. Stratified random

sampling method was adopted for the sampling of the study. Stratified sampling method involves the process of dividing the population into separate groups according to selected characteristics and choosing participants from these stratified groups (Parsons, 2017). In this stratified sampling, the strata were determined based on the geographical regions of Türkiye and each stratum stood for the universities with EFL programs in each region. The sampling process was carried out through the data obtained from YÖK Atlas, the Turkish Higher Education Program Atlas. Turkish universities overseas, departments of Turkish universities located outside of Türkiye, and universities in the Turkish Republic of Northern Cyprus were not included in the list of universities for stratified sampling. When the universities on the list were stratified based on their geographical regions, it was revealed that four out of the seven geographical regions did not have any private universities with EFL departments. Moreover, every public university did not have 4th-year EFL students as some departments were established three or less academic years ago as of the 2023-2024 academic year (Table 1). Thus, in order to collect data from universities with similar population demographics, only public universities were involved in the process of sampling.

Table 1

Number of EFL Departments in Turkish Universities

Region	The number of universities with EFL departments	Public universities	Foundation universities
Southeastern Anatolia	5	4	1
Aegean	6	6	0
Eastern Anatolia	7	7	0
Mediterranean	8	8	0
Black Sea	10	10	0
Central Anatolia	15	12	3
Marmara	22	11	11
Total	73	58	15

For the randomization of the sample, public universities in each region were contacted for permission to collect data and those universities that granted permission for data collection and agreed to assist the process were included in the data collection process. Through the sampling process, sixteen public universities out of 53 public universities with 4th-year EFL students were determined as the location of data collection. Data collection through scales, group interviews with pre-service teachers, and interviews with academics were carried out in these sixteen universities (Table 2). The piloting process was also carried out in several of these universities. The scales were piloted with 4th-year EFL students at Sakarya University. The piloting of the group interview form for pre-service teachers was done with pre-service teachers from Hacettepe University, Gazi University, and Atatürk University.

The scale data was collected from fifteen universities in the seven geographical regions of Türkiye. Prior to data collection, pre-service teachers were given informed consent forms (Appendix-A) and those who agreed to take part in the study were included in the data collection through the scales. In total, 384 valid scale responses were collected. Of these 384, four were omitted from data analysis as more than 10% of the scale items were left unanswered by the students. Any scales with less missing value items were included in the data analysis process. After removing the outlier values, 374 scale responses formed the sample size for the scale implementation stage of the current study. The group interviews with pre-service EFL teachers were carried out with six groups in five universities (eighteen pre-service 4th-year EFL teachers in total, with each group consisting of three pre-service teachers) while interviews with academics were implemented in seven universities with nine academics. In order to determine the interviewees for the pre-service teachers' group interviews, a consent section for interview participation was added to the informed consent forms that pre-service teachers signed when they volunteered to take part in the data collection process through scales (Appendix-A). The pre-service teachers

marked this section and shared their contact information if they wanted to be included in the interviews.

The pre-service teachers that took part in the piloting of the scales and not in the piloting of the semi-structured interview forms were also given this option for whether they would like to participate in the interviews. The pre-service teachers who gave consent to take part in the interviews were contacted. The ones that responded affirmatively to the emails or messages were sent an informed consent form for the interviews (Appendix-B) and they were included in the group interviews. In total, eighteen pre-service teachers participated in the semi-structured group interviews, with three being from the university where the scales were piloted. Thus, the number of pre-service teachers that participated in the study reached 377 in total.

The academics from the universities that gave permission for data collection were contacted for interviews. The academics that volunteered took part in the semi-structured interviews. Informed consent forms (Appendix-C) were also sent to the academics that took part in the study. For the interviews with academics, only EFL academics who held a PhD degree and who gave courses or are supervisors to fourth-year pre-service EFL teachers were included in the data collection process. The academics that took part in the study were three professors, one associate professor, four assistant professors, and one research assistant with PhD degree (Table 2).

Table 2

Data Collection Settings by Instrument

Region	University	Scale implementation	Group interview (4^{th}-year students)	Interview (Academics)
Marmara Region	Kocaeli University	✓	✓	✓
	Sakarya University		✓	✓
	Hacettepe University	✓	✓	✓

Central Anatolia Region	Gazi University	✓		
	Necmettin Erbakan University	✓		
	Anadolu University	✓		
Eastern Anatolia Region	Atatürk University	✓		✓
	Van Yüzüncü Yıl University	✓		
Black Sea Region	Ondokuz Mayıs University	✓	✓	✓
	Bartın University	✓	✓	✓
Mediterranean Region	Burdur Mehmet Akif Ersoy University	✓		
	Çukurova University	✓		
Aegean Region	Muğla Sıtkı Koçman University	✓		
	Pamukkale University	✓		✓
	Aydın Adnan Menderes University	✓		
Southeastern Anatolia Region	Gaziantep University	✓		

As of the 2023-2024 academic year, the total estimated number of 4th-year EFL students is 4536, with 3766 estimated to be in public universities and 770 in foundation universities (Table 3). The number of 4th-year EFL students is estimated rather than exact due to the fact that YÖK Atlas provides information and statistics on university departments regarding the previous three academic years. For this reason, in order to calculate the possible number of 4th-year EFL students, the researcher made an estimation based on the number of students enrolled in the most recent academic year and the total number of

students enrolled in the department. Considering the estimated number of 4th-year EFL students in public universities, it was understood that the Central Anatolia and Marmara regions had the highest number of students, respectively, at the time of data collection. These regions were followed by the Black Sea, Mediterranean, Eastern Anatolia, Aegean, and Southeastern Anatolia regions. In terms of estimated 4th-year EFL student population in foundation universities, the highest number was predicted to be in the Marmara Region followed by the Central Anatolia and Southeastern Anatolia regions. According to the data retrieved from YÖK Atlas during November 2023, the remaining four regions did not have any foundation universities with EFL programs as of the 2023-2024 academic year.

Table 3

Total Estimated Number of 4th-year EFL Students

Region	The estimated number of 4th-year EFL students in public universities	The estimated number of 4th-year EFL students in foundation universities	Total estimated number of 4th-year ELT students
Southeastern Anatolia	186	55	241
Aegean	372	0	372
Eastern Anatolia	444	0	444
Mediterranean	485	0	485
Black Sea	553	0	553
Central Anatolia	876	165	1041
Marmara	850	550	1400
TOTAL	3766	770	4536

The sample size of the study was calculated based on the estimated number of 4th-year EFL students in public universities. In order to calculate the sample size required for the quantitative data collection process, the confidence level was determined to be 95% with a margin of error of 5% (Kılıç, 2012). Since the estimated population of the fourth-year pre-service EFL teachers in public universities, the population size was determined to be

3766 for the sample size calculation. Based on these parameters, the required sample size was calculated to be 349. As the sample size of the current study is 374 for the quantitative data, it is considered an appropriate sample size for the study (Table 4).

Table 4

Distribution of Data Collected from Regions

Region	University	Scale-Student	Group Interview	Academician Interview
Marmara Region	Kocaeli University	36	6 Students (2 groups)	2 Academics
	Sakarya University	---	3 Students	1 Academic
Central Anatolia Region	Hacettepe University	36	3 Students	1 Academic
	Gazi University	36	---	---
	Necmettin Erbakan University	6	---	---
	Anadolu University	2	---	---
Eastern Anatolia Region	Atatürk University	61	---	1 Academic
	Van Yüzüncü Yıl University	7	---	---
Black Sea Region	Ondokuz Mayıs University	52	3 Students	1 Academic
	Bartın University	24	3 Students	2 Academics
Mediterranean Region	Burdur Mehmet Akif Ersoy University	34	---	---
	Çukurova University	6	---	---
Aegean Region	Aydın Adnan Menderes University	10	---	---
	Muğla Sıtkı Koçman University	8	---	---
	Pamukkale University	12	---	1 Academic
Southeastern Anatolia Region	Gaziantep University	44	---	---
Total	16 Universities	374	18 Students	9 Academics

In terms of the gender distribution in the data, the sample indicated that female rep-service teachers dominated the participants in terms of the data collection process through the scales. 228 out of 374 participants were females in the scale implementations process. In the semi-structured interviews fifteen out of eighteen pre-service teachers were females in the study whereas six out of nine academics who participated in the interviews were females.

For the sample size for the qualitative data, Dörnyei (2007) stated that 6-10 participants for interviews would be suitable. Guest et al. (2020) also suggested that “typically 6–7 interviews will capture the majority of themes in a homogenous sample” (p. 13). Since the group interviews were carried out with 18 students (six groups of three students) and the interviews were carried out with nine academics (Table 4), the sample size for the qualitative data was also considered to be an appropriate sample size for the current study.

Data Collection

The data collection process took place during the Fall and Spring terms of the 2023-2024 academic year. The data was collected through scales, interviews, and group interviews. The interview form for academics was piloted with academics from nine universities in six geographical regions. The data collection for the piloting of the scales took part prior to the data collection for piloting the group interview form for pre-service teachers and the interview form for academics. Likewise, the data from scales were collected before the interviews with pre-service teachers and academics.

The data for the piloting of the scales was collected from Sakarya University at the beginning of December 2023. The data for the piloting of the group interview form for pre-service teachers was collected in December 2023, January 2024 and April 2024 with three pre-service teacher groups while the piloting of the interview form for academics took place between December 2023 and March 2024. The data collection through scales took place

over seven months from December 2023 to May 2024. After the scale administration, group interviews with pre-service teachers and EFL academics were carried out. The process of carrying out group interviews with pre-service teachers took place over the course of ten days in May 2024 while interviews with academics spanned over three weeks in May and June 2024. The two scales used in this study were implemented face-to-face and online with pre-service teachers in the 4th-year of their EFL programs. The group interviews with pre-service teachers and interviews with academics were carried out online through Zoom.

Instruments

The data collection instruments consisted of two scales, a semi-structured interview form for group interviews with pre-service teachers and a semi-structured interview form for interviews with academics.

Motivation to Teach Scale

The Motivation to Teach Scale (MTS) was developed by Kauffman et al. (2011) in order to evaluate pre-service teachers' motivation to teach (Appendix-D). The necessary permission for use was obtained from Merve Yılmaz Soylu, who is one of the scale developers and owners (Appendix-H). The scale involves twelve items, which constitutes a two-factor model with statements regarding intrinsic and extrinsic motivation of pre-service teachers. The instrument adopts a Likert scale layout, which involves numbers from 1 to 6 and statements from Strongly Disagree to Strongly Agree. Strongly Disagree corresponds to 1 while Strongly Agree corresponds to 6. The scale development process involved one hundred forty-seven undergraduate pre-service teachers. The validity, reliability, and factor analysis procedures were carried out by the scale developers. The validity and reliability tests of the scale indicated that the instrument is both a valid and reliable tool to determine pre-service EFL teachers' motivation to teach. The Cronbach's Alpha value for the intrinsic sub-scale was ,86 while the extrinsic sub-scale's value was ,76 (Kauffman et al., 2011), which indicated high reliability of the scales. Güzel Candan and Evin Gencel (2015) also

adapted the scale to Turkish and their analyses indicated the validity and reliability of the scale.

EFL-TPACK Scale

The EFL-TPACK Scale was developed by Wang (2022) in order to evaluate EFL teachers' TPACK (Appendix-E). The necessary permission for use was obtained from Amber Yayin Wang, who is the developer and owner of the scale (Appendix-I). The scale involves seven sub-sections with a total of forty-nine items. The TPCK sub-scale consists of 28 items and 4 sub-sections whereas the PCK sub-scales consists of 21 items and 3 sub-sections. The instrument adopts a Likert scale layout, which involves numbers from 1 to 5 and statements from Strongly Disagree to Strongly Agree. Strongly Disagree corresponds to 1 while Strongly Agree corresponds to 5. The scale development process involved five hundred twenty-five undergraduate EFL teachers. The validity, reliability, and factor analysis procedures were carried out by the scale developer. The validity and reliability tests of the scale indicated that the instrument is both a valid and reliable tool to determine EFL teachers' TPACK.

Semi-Structured Interview Forms for Pre-service Teachers and Academics

Two separate interview forms were prepared for the semi-structured interviews with pre-service teachers (Appendix-F) and academics (Appendix-G) for the data collection through interviews. These data collection tools were developed by the researcher in order to collect qualitative data on pre-service teachers' self-reports on their TPACK and motivation to teach and to collect qualitative data from academics on their students' TPACK and motivation to teach. An initial interview guide was prepared first to be piloted (Dörnyei, 2007). For the validity and reliability of the interview questions field experts were consulted. Based on the feedback from field experts, the interview questions were refined and re-designed. The refined versions of the forms were then piloted with academics and pre-service teachers to determine their validity and reliability. The Cronbach's Alpha value for the TPCK sub-scale was ,98 and the PCK subscale's value was ,97 while the TPACK

scale's Cronbach's Alpha value was ,98 (Wang, 2022), which indicated high reliability of the scales.

Piloting of the Research Instruments

In order to test the reliability of the scales developed by Kauffman et al. (2011) and Wang (2022) the instruments were employed with a group of pre-service EFL teachers. The context of the piloting of the scales was chosen from the universities that agreed to take part in the study. In order to determine the university context for the piloting, an online random number generator was used. Through this process, Sakarya University was determined as the context for the piloting of the quantitative data collection instruments. Thirty-two pre-service EFL students participated in the piloting of the scales. The Cronbach's Alpha levels for each scale were calculated separately.

Prior to reliability analysis, the normality of the data was analyzed. As the data was aimed to be analyzed based on the total scores of participants in each scale, the analysis of the normality and outliers during the piloting stage was applied to the total scores of the participants regarding the two scales. The normality analysis revealed that the skewness and kurtosis values for each scale were within the normal range since the values were between -1,5 to +1,5 range (Tabachnick & Fidell, 2013). The mean and 5% trimmed mean values for each scale was quite close with -0,64 for the Motivation to Teach Scale and -1.27 for the EFL-TPACK Scale, signaling that the data set did not have extreme values (Table 5).

Table 5

Descriptives for the Scales in Piloting

		Statistic	Std. Error
Motivation to Teach	Mean	47,9643	2,02333
	5% Trimmed Mean	48,6111	
	Std. Deviation	10,70646	
	Skewness	-,752	,441

	Kurtosis	,777	,858
EFL-TPACK	Mean	202,5357	4,48557
	5% Trimmed Mean	203,8095	
	Std. Deviation	23,73540	
	Skewness	-,986	,441
	Kurtosis	1,008	,858

The values for normality were evaluated based on the Shapiro-Wilk test since the sample size is smaller than 50 (Table 6). The results of the normality tests for both scales were evaluated to be normal as the P values were significant (p > 0,05). Considering the parameters of means, 5% trimmed means, skewness, kurtosis, and normality tests, it was concluded that the data for both scales were normally distributed and that the data did not include any outliers.

Table 6

Tests of Normality for the Scales in Piloting

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Motivation to Teach	,107	28	,200*	,946	28	,160
EFL-TPACK	,165	28	,049	,935	28	,083

Following the normality analysis, missing value analysis was carried out to see whether there were any questions that the pre-service teachers left unanswered in the scales. Little's Missing at Completely Random (MCAR) Test was performed to uncover whether there were missing values and whether they were missing at random. The MCAR test was implemented for each scale's items separately. The analysis of missing values showed that the Motivation to Teach Scale had 3,1 percent of data missing in scale items 2 and 12, which indicated that for each item a pre-service teacher did not provide a response. The total percentage of the missing value for the Motivation to Teach Scale was 6,3 percent, which indicated that the statistical analysis was unlikely to be biased as less

than 10% of the data were missing (Bennett, 2001) and thus, it was possible to ignore the missing data (Hair et al., 2010). Little's MCAR result for the scale was 0,711. As the MCAR value was higher than 0.05, the analysis indicated that the data was missing at completely random. The missing value analysis for the EFL-TPACK Scale revealed that there was also 3,1 percent missing data in the set as one pre-service teacher for each of items 27 and 47 did not provide a response. The total percentage of the missing value for this scale was 6,3 percent as well, indicating that the statistical analysis was not likely to be biased (Bennett, 2001). The MCAR result for this scale was 1,000, meaning that the data was missing completely at random for the EFL-TPACK Scale as well. These results also indicated that the ratio of missing value to the data set was low. The missing values were treated through the Expectation-Maximization (EM) technique. The reason for treating missing values rather than leaving them out of the data set was to prevent loss of data. The EM technique was chosen for the treatment of missing values as it is one of the maximum likelihood methods for treating missing data (Pigott, 2001). The EM technique was administered to data from the two scales separately.

The Cronbach's Alpha value for the Motivation to Teach Scale was 0,836 while the Cronbach's Alpha value for the EFL-TPACK Scale was 0,960 (Table 7). As Cronbach's Alpha values higher than 0,7 are acceptable (Pallant, 2007; 2016) the scales were found to be reliable. The Motivation to Teach Scale and the EFL-TPACK Scale have two subscales each. The items of the Motivation to Teach Scale comprises intrinsic motivation and extrinsic motivation whereas the EFL-TPACK Scale has two sub-sections as PCK and TPCK. The intrinsic motivation subscale had 7 items, and the extrinsic motivation scale had 5 items. The PCK subscale of the EFL-TPACK Scale had 21 items while TPCK had 28 items.

Table 7

Reliability Analysis for the Scales in Piloting

	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
Motivation to Teach	,836	,835	12
EFL-TPACK	,960	,961	49

The reliability analyses for these subscales revealed the following Cronbach's Alpha values: Intrinsic motivation (Alpha=0,847), Extrinsic motivation (Alpha=0,555), PCK (Alpha=0,936), and TPCK (Alpha=0,940) (Table 8). The only subscale that revealed an Alpha value lower than 0,7 was extrinsic motivation, which only had 5 items. Pallant (2016) states that Cronbach's Alpha values for scales with less than 10 items would be small and it is preferable to report the mean inter-item correlations, for which an inter-item correlation of ,2 to ,4 is recommended to be the optimal range (Briggs & Cheek, 1986, as cited in Pallant, 2016). The mean inter-item correlation for the extrinsic motivation scale was found to be ,214 (Table 9), suggesting that the value is within the optimal range recommended. Given the overall and sub-scale reliability analyses, the Motivation to Teach Scale and the EFL-TPACK Scale were considered reliable.

Table 8

Reliability Analysis for the Subscales in Piloting

	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
Intrinsic Motivation	,847	,851	7
Extrinsic Motivation	,555	,577	5
PCK	,936	,938	21
TPCK	,940	,942	28

Table 9

Inter-Item Correlations Mean for the Extrinsic Motivation Subscale

	Mean	Minimum	Maximum	N of Items
Item Means	4,288	4,063	4,563	5
Inter-Item Correlations	,214	-,042	,442	5

The piloting of the semi-structured interview form for pre-service teachers developed through expert opinion was carried out with pre-service teacher groups from several universities. Pre-service teachers from the universities where data collection was permitted were invited to the group interviews for piloting. As the group interviews were intended to be conducted separately for each institution, pilot group interviews were carried out at universities with a sufficient number of student volunteers to constitute a group. For this reason, universities where three or more pre-service teachers volunteered were included in the pilot study. Universities where fewer than three pre-service teachers volunteered were excluded from the pilot study.

Three group interviews with ten pre-service teachers were held during the piloting of the semi-structured interview form for pre-service teachers. Five female and five male pre-service teachers took part in the piloting of the semi-structured interview form for pre-service teachers. Four pre-service teachers from Hacettepe University, three pre-service teachers from Gazi University, and three pre-service teachers from Atatürk University participated in the piloting process. The semi-structured form consisted of eleven questions with some questions having several parts. No background information was provided to pre-service teachers regarding key terminologies such as TPACK and its components. After the piloting, the interview form was shortened with the insights from the interview data collected and the feedback from the thesis monitoring committee. The researcher also decided to implement an explanatory session right before each group interview where she explained the key terminologies included in the interview form. The final version of the form to be used in the main study consisted of seven questions with several questions having sub-questions to clarify the main questions. The final format of the semi-structured group interview form for pre-service teachers consisted of the following questions:

1. How do you assess your technological pedagogical content knowledge (TPACK)? How do you define your competency level of TPACK?

2. How do you explain your effort to develop your TPACK? What do you do to develop your TPACK?

3. How do you assess the effect of your faculty courses on your TPACK? How do the courses you take at your faculty contribute to your TPACK? Apart from the courses, is there any other resource that your faculty provide to support your TPACK?

4. How do you assess your motivation to teach? How motivated are you to teach?

5. How do you define your effort to improve your motivation to teach? Is there anything you do to increase your motivation to teach?

6. How do you assess the effect of your faculty courses to your motivation to teach? How do the courses you take at your faculty contribute to your motivation to teach? Apart from the course, is there any other resource that your faculty provide to support your motivation to teach?

7. How do you define the relationship between your TPACK and your motivation to teach? Do you think there is a relationship between them? If so, how do they relate to each other?

The piloting of the semi-structured interview form for academics developed through expert opinion was implemented with EFL academics from nine universities. EFL academics from the universities where data collection was permitted were invited to the interviews for piloting. Nine EFL academics were included in the piloting stage of the interview form. The academics were from Kocaeli University, Sakarya University, Hacettepe University, Gazi University, Atatürk University, Ondokuz Mayıs University, Çukurova University, Necmettin Erbakan University and Gaziantep University. Only EFL academics who are doctoral faculty members, associate professors and professors were included in the piloting. Four female and five male academics took part in the piloting of the semi-structured interview form for academics.

Prior to the piloting stage, the semi-structured form for academics consisted of eleven questions as well, with some questions having multiple parts. After the piloting, the interview form for academics was also shortened for precision based on the interview data collected and the feedback from the thesis monitoring committee. The final version of the form to be used in the main study consisted of six questions with several questions having sub-questions to clarify the main questions. The final format of the semi-structured interview form for academics to be implemented with EFL academics during the main study consisted of the following questions:

1. How do you assess your students' technological pedagogical content knowledge (TPACK) competency level?

2. In which areas of their TPACK do you think they have strength? In which areas do you think they need to develop their TPACK?

3. What kind of curricular materials and courses do you provide for your students to improve their TPACK levels? Within the curriculum, is there anything else you do or implement to support their TPACK?

4. What kind of extra-curricular materials, resources, and workshops do you provide for your students to improve their TPACK levels? Apart from the curriculum, is there anything else you do or implement to support their TPACK?

5. How do you assess your students' motivation to teach? In your opinion, how motivated are they to teach? Can you elaborate?

6. How do you define the relationship between your students' TPACK and their motivation to teach? Do you think there is a relationship between their TPACK and their motivation to teach? If so, how do they relate to each other?

Data Analysis

The data collected in this study required both qualitative and quantitative data analysis procedures. In order to analyze quantitative data, the normality of the data was first tested to decide whether the data was normally distributed for parametric tests. The normality analysis revealed that the data was normally distributed for simple linear regression analysis and other parametric tests. The analysis of the qualitative data was carried out through thematic analysis.

Table 10

Data Analysis Based on Research Questions

Research Questions	Instruments	Data Collection Method	Data Analysis
What is the impact relation between pre-service EFL teachers' TPACK and their motivation to teach?	Motivation to Teach Scale, EFL-TPACK Scale	Quantitative	Simple Linear Regression Analysis
	Semi-structured Interview Forms	Qualitative	Thematic analysis
What is pre-service EFL teachers' level of motivation to teach?	Motivation to Teach Scale	Quantitative	Descriptive Statistics, Paired Samples T Test, Kruskal-Wallis Test
What is the technological pedagogical content knowledge level of pre-service teachers?	EFL-TPACK scale	Quantitative	Descriptive Statistics, Paired Samples T Test, One-Way ANOVA Test
What are the views of the academics in EFL departments about their students' TPACK and their motivation to teach?	Semi-structured Interview Form for Academics	Qualitative	Thematic analysis

What are the views of pre-service EFL teachers regarding their TPACK and their motivation to teach?	Semi-structured Interview Form for Pre-service Teachers	Qualitative	Thematic analysis

The analysis processes carried out for the data analyzed for each research question is presented above (Table 10). The following sections in this chapter provide explanations on the normality analysis of the quantitative data and the procedures involved in the thematic analysis of the qualitative data.

Analysis of the Quantitative Data

Statistical Package for the Social Sciences (SPSS) 23 was used for the analysis of quantitative data to be obtained from the Motivation to Teach Scale and the EFL-TPACK Scale for EFL Teachers. Kolmogorov–Smirnov Test was utilized to test whether the data was normally distributed or not as the sample size was larger than 50. Descriptive statistics was also consulted to determine the self-reported levels of TPACK and motivation to teach. The data collected through scales were checked for normality as a normal distribution is a prerequisite for any parametric test. Prior to testing normality, any scale data that was erroneous was omitted from the data. The normality test used for the data was the Kolmogorov-Smirnov as the sample size was greater than 50 (Mishra et al., 2019). Apart from the Kolmogorov -Smirnov test, skewness, kurtosis, Q-Q plot values were also considered when determining the normality of the data as these are among the most favored methods of testing normality (Mishra et al., 2019). After normality analysis, the data set was also analyzed for missing values. The missing values detected within the data were analyzed with Little's MCAR (Missing Completely at Random) test and treated through the EM (Expectation-Maximization) technique.

The analysis of normality for the Motivation to Teach Scale revealed one outlier value that was removed from the data set. After removing the outlier, the normality of the data was tested again. The result of the Kolmogorov-Smirnov test resulted in a significance

level of 0,00, which is interpreted as that the data may not be normally distributed. However, violations of normality in samples sizes with more than 100 observations is considered negligible (Mishra et al., 2019) and the violation of normality is also viewed as common with big sample sizes (Pallant, 2010) while such large samples are prone to normal distribution even when the results of tests of normality are below the 0,05-significance level (Table 11).

Table 11

Normality Test for the Motivation to Teach Scale before Treating Missing Data

	Kolmogorov-Smirnov			Shapiro-Wilk		
Motivation to Teach	Statistic	df	Sig.	Statistic	df	Sig.
	,074	360	,000	,971	360	,000

Thus, in order to determine whether the data was normally distributed for the Motivation to Teach Scale, the values of skewness, kurtosis, Q-Q plot were analyzed as well as the mean and 5% trimmed mean values. The skewness and kurtosis values were within the normal range as the values were between -1,5 to +1,5 range (Tabachnick & Fidell, 2013). The Q-Q plot also revealed a distribution close to normal with no significant deviations. Besides, the mean and 5% trimmed mean values were close to each other with only a -0.45-point difference (Table 12). When these values were considered, it was concluded that the data for the Motivation to Teach Scale was normally distributed.

Table 12

Descriptives for the Motivation to Teach Scale before Treating Missing Data

		Statistic	Std. Error
Motivation to Teach	Mean	49,6500	,55439
	5% Trimmed Mean	50,0926	
	Std. Deviation	10,51884	
	Skewness	-,635	,129
	Kurtosis	,241	,256

The analysis of normality for the EFL-TPACK Scale was also done following the same procedure. The Kolmogorov-Smirnov test carried out for the EFL-TPACK Scale

indicated that the data was normally distributed as the test resulted in a significance level of 0,08 (Table 13). Nevertheless, the other values were still checked to ensure that the data had normal distribution.

Table 13

Normality Test for the EFL-TPACK Scale before Treating Missing Data

	Kolmogorov-Smirnov			Shapiro-Wilk		
EFL-TPACK	Statistic	df	Sig.	Statistic	df	Sig.
	,045	354	,081	,987	354	,004

The skewness and kurtosis values were within the -1,5 to +1,5 range (Tabachnick & Fidell, 2013) for normal distribution. The Q-Q plot involved no significant deviations and revealed a distribution close to normal. The mean and 5% trimmed mean values were close to each other as only a -0.38-point difference was observed (Table 14). When the significance value of the normality test and the values described above were considered, it was concluded that the data for the EFL-TPACK Scale was normally distributed.

Table 14

Descriptives for the EFL-TPACK Scale before Treating Missing Data

		Statistic	Std. Error
EFL-TPACK	Mean	200,5734	1,13220
	5% Trimmed Mean	200,9548	
	Std. Deviation	21,30213	
	Skewness	-,200	,130
	Kurtosis	-,016	,259

The normality analysis carried out for both scales revealed that there were missing values within the data set. The analysis revealed that there was a 5,3% and 6,8% missing value in the data collected through the Motivation to Teach Scale and the EFL-TPACK Scale, respectively. The analysis of the missing values for each item of the scales revealed that the highest ratio of missing values in the items of the scales was 1,1%. As the ratio of the missing data was less than 10%, the statistical analysis was unlikely to be biased

(Bennett, 2001) and it was possible that the missing values could be ignored (Hair et al., 2010). Similar to the piloting stage, Little's Missing at Completely Random (MCAR) Test was performed for the main data set to uncover whether they were missing at random. The missing value analysis was carried out for data from each scale separately. Little's MCAR test provided a significance level of 0,325 for the Motivation to Teach Scale and 0,064 for the EFL-TPACK Scale. As the null hypothesis assumes that the data is missing completely at random, and the p value is significant at the 0.05 level, the result of the analysis indicated that the data was missing at completely random for each scale since the significance value for each scale was higher than 0,05, and thus, not statistically significant. Since the missing values were low in ratio and missing completely at random, it was possible to treat them through imputation. The missing values were handled through imputation rather than deletion for the purpose of preventing loss of data. For the imputation, the EM technique was chosen since it is one of the maximum likelihood methods for treating missing data (Pigott, 2001). The EM technique was administered separately for the two scales.

The normality of the data collected through both scales were carried out once again after the missing value imputation process. The analysis revealed that the Kolmogorov-Smirnov test results for the scale were ,000 for the Motivation to Teach Scale and ,087 for the EFL-TPACK Scale (Table 15). As violations of normality in a sample size such as the one in this is regarded negligible (Mishra et al., 2019), the results of the Kolmogorov-Smirnov test for the Motivation to Teach Scale was not directly accepted as an indication of violation of normal distribution and the parameters of normality were checked in order to determine whether the data collected from these two scales were normally distributed after the missing value imputation.

Table 15

Normality Test for the Scales after Treating Missing Data

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Motivation to Teach	,075	380	,000	,967	380	,000

EFL-TPACK	,043	380	,087	,988	380	,004

The mean values, 5% trimmed mean values, skewness and kurtosis values as well as the Q-Q plots for both scales were checked to determine the normality of the data. The mean and 5% trimmed mean values were close to each other with less than 0,5-point difference for both scales. The skewness and kurtosis values were observed to be within the -1,5 to +1,5 range (Tabachnick & Fidell, 2013) for normal distribution (Table 16). The Q-Q plots for both scales also involved no significant deviations and revealed a distribution close to normal.

Table 16

Descriptives for the Scales after Treating Missing Data

		Statistic	Std. Error
Motivation to Teach	Mean	49,6070	,55315
	5% Trimmed Mean	50,1022	
	Std. Deviation	10,78281	
	Skewness	-,679	,125
	Kurtosis	,321	,250
EFL-TPACK	Mean	200,6245	1,10602
	5% Trimmed Mean	200,9219	
	Std. Deviation	21,56039	
	Skewness	-,139	,125
	Kurtosis	-,035	,250

The analyses carried out for normality after imputation yielded quite similar values to the ones that were obtained before missing value imputation as the results above indicated. The normality of the data was concluded to have normal distribution prior to the missing value imputation. The same conclusion was reached after the normality of the data was checked upon missing value imputation. As it was concluded that the data was normally distributed, linear regression analysis was used in the analysis of the quantitative data collected through the scales rather than utilizing a non-parametric analysis in the main research question. The analysis of quantitative data for the second and third research

questions were carried out through parametric as well as non-parametric tests based on the normality analysis of the data in relation to the factors involved in the analysis process of each question.

Analysis of the Qualitative Data

In order to analyze the qualitative data to be obtained from semi-structured forms for group interviews with pre-service teachers and interviews with academics, thematic analysis was carried out. The thematic analysis process was conducted separately for group interviews with pre-service teachers and interviews with academics. For the process of thematic analysis, the data was first transcribed. Then, the coding and pattern (theme) identifying processes were conducted. These processes were carried out using the MAXQDA data analysis software, which is specifically designed for the analysis of qualitative data. As defined by Braun and Clarke (2006), thematic analysis is a method in qualitative data analysis that is used for identifying, analyzing and reporting themes in data (p. 79). The difference between thematic analysis and other qualitative data analysis methods such as grounded theory and discourse analysis is that thematic analysis is not bound by any theoretical framework (Braun & Clarke, 2006). Guest et al. (2012) described the processes involved in thematic analysis for determining themes in the following way:

> Thematic analyses move beyond counting explicit words or phrases and focus on identifying and describing both implicit and explicit ideas within the data, that is, themes. Codes are then typically developed to represent the identified themes and applied or linked to raw data as summary markers for later analysis. (p. 9)

The thematic analysis process carried out in this study followed an inductive approach, which involves the coding of the data in a data-driven manner without any preexisting coding frame (Braun & Clarke, 2006). In order to ensure rater reliability of thematic analysis, the processes of coding and forming themes was checked through intercoder reliability was analyzed. Though intercoder reliability is argued to be redundant by some researchers in qualitative research, it is still a recommended practice (O'Connor &

Joffe, 2020). The intercoder reliability process for this study was carried out through the help of an external coder that was already familiar with the process of thematic analysis and qualitative data coding. She held a bachelor's degree and a master's degree in EFL and worked as a research assistant in an EFL department in a Turkish state university, meaning that she was also familiar with the context that this study set out to analyze.

The intercoder/interrater reliability process involved the double-coding of a portion of the coded data and comparing the difference between the codes and themes determined by the research and the external coder. Prior to this process, the purpose of the research, the contexts from which the qualitative data were collected, and the rationale behind the codes and themes determined by the researcher were explained to the external coder. As simple percentage agreement is one of the statistical methods of interrater reliability calculation (Mackey & Gass, 2005; Loewen & Philp, 2012) and as the double-coding of 15-20% of the data in observational studies is deemed as acceptable in the case of high agreement between the two coding processes (Loewen & Philp, 2012), the intercoder reliability of the current study followed the procedure of double-coding 20% of the coded data. The total number of coded extracts for interviews with academics and group interviews with pre-service teachers were calculated. 109 coded cases for academics and 317 coded cases for pre-service teachers were observed in the data by the researcher. Twenty-two coded instances from the interviews with academics and sixty-four coded instances from the group interviews with pre-service teachers were randomly chosen from the data for the double-coding process.

The researcher and the external coder found disagreement in one coded instance out of the twenty-two instances from interviews and four coded instances out of the sixty-four instances. In three of these cases the instances were re-coded as outliers instead of belonging to any particular theme whereas category changes were done in the remaining two instances. Since the ratio of the disagreement between the researcher's and the external coder's coding was observed in less than 10% of the instances, the interrater

reliability of the coding processes was concluded to be acceptable as percentages higher than 90% are accepted as ideal (Mackey & Gass, 2005).

Ethical Considerations

In order to carry out this study, permission was obtained from the Hacettepe University Ethics Commission. After obtaining permission from the Hacettepe University Ethics Committee, the universities where the study was to be conducted were also contacted. The participants in the study signed informed consent forms prior to the collection of data and they held the right to withdraw from the study anytime. Anonymity of the participants was maintained through assigning pseudonyms.

Chapter 4

Findings, Comments and Discussion

This chapter presents the findings of data analysis carried out for the quantitative and qualitative data collected in this study. Following the findings, comments and discussion on the analysis findings are presented.

Findings of the Data Analysis

The findings of the data analysis procedure for both qualitative and quantitative data collected in this study are introduced in this section in line with the research questions of this study, which are as follows:

Main Research Question:

Research Question 1: What is the relation between pre-service EFL teachers' TPACK and their motivation to teach?

Sub-research Questions:

Research Question 2: What is pre-service EFL teachers' level of motivation to teach?

Research Question 3: What is pre-service EFL teachers' level of technological pedagogical content knowledge?

Research Question 4: What are the views of pre-service EFL teachers regarding their TPACK and their motivation to teach?

Research Question 5: What are the views of the academics in EFL departments about their students' TPACK and their motivation to teach?

The analysis was carried out following the order of the research questions. Accordingly, the results of the analyses were reported for each question one by one.

Research Question 1: What is the relation between pre-service EFL teachers' TPACK and their motivation to teach?

In order to answer the main research question, both quantitative and qualitative data collection tools were utilized. The data from the EFL-TPACK Scale (Wang, 2022) and the Motivation to Teach Scale (Kauffman et al., 2011) were analyzed first to reveal the relation between TPACK and motivation teach while thematic analysis was adopted to analyze the data from the interview questions conducted with pre-service teachers and academics.

Findings of Quantitative Data

For the analysis of the quantitative data, simple linear regression analysis was adopted. In order to see whether the data was suitable for carrying linear regression analysis, the preliminary analyses were carried out regarding the pre-conditions of sample size, normality, linearity, distribution of residuals, multicollinearity, homoscedasticity, and independence of errors in relation to simple linear regression analysis. As two regression models with each variable (the Motivation to Teach Scale data and the EFL-TPACK Scale data) placed as the dependent variable were to be explored for this step, preliminary analyses were carried out for both variables. Two models were necessary since the reciprocal relation of each variable in regression analysis was to be explored. The sample size was determined to be suitable for regression analysis. Field (2013) suggests having at least 15 cases per predictor for regression analysis. This study fulfilled the sample size condition as there are 374 cases (after outlier deletion) for investigation. Normality and linearity analyses were carried out first. All the steps after normality analysis and linearity analysis carried out during regression analysis were repeated for two different models. In the first model, the Motivation to Teach Scale was placed as the dependent variable while the EFL-TPACK Scale was placed as the independent variable. In the second model, the two variables were placed in the model in reverse order. The EFL-TPACK Scale was the dependent variable whereas the Motivation to Teach Scale was the independent variable in the second model. The reason for doing the same analyses with two different models

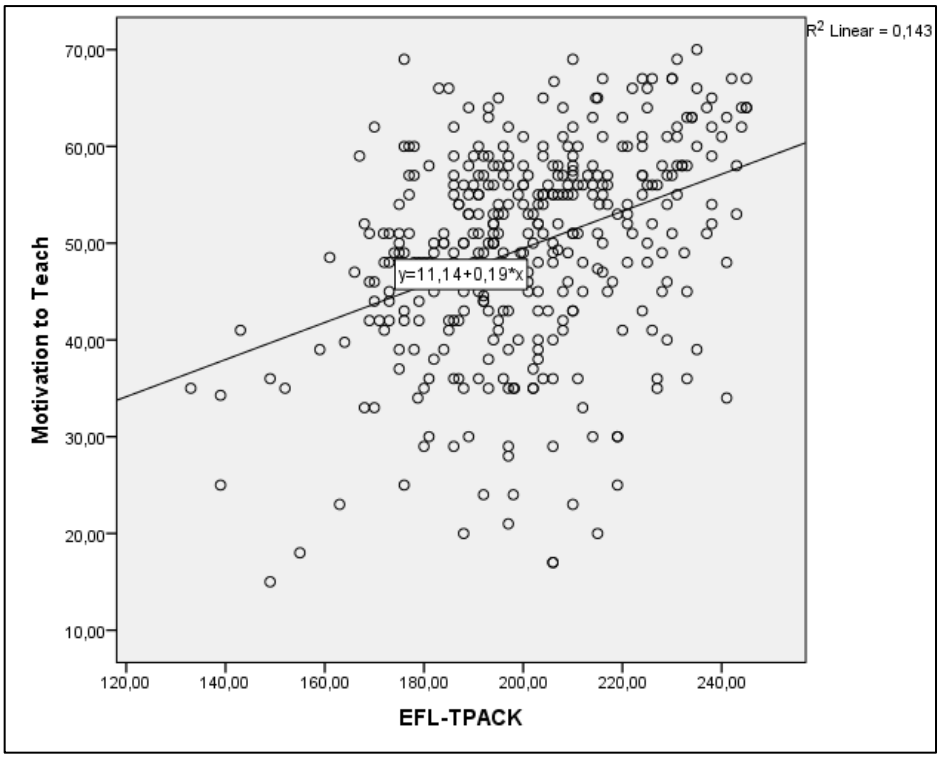
was to reveal the direction of the relation between the two variables in terms of which variable better predicts the other variable. The preliminary analyses revealed that all pre-conditions of linear regression analysis were met.

The normality analysis was carried out when scale data was collected and checked for normality for parametric testing. Results of the normality analysis indicated that the data had normal distribution. The Kolmogorov-Smirnov test for normality yielded a significance level of 0,08 and the other normality parameters signaled normal distribution for the EFL-TPACK Scale. While the normality test resulted in a 0,00 level of significance for the Motivation to Teach Scale, it was concluded that the data from this scale also had normal distribution based on the sample size, skewness and kurtosis levels, Q-Q plot, and the other normality parameters. Based on this analysis, it was determined that the data met the normality criterion for regression analysis.

In order to determine the linearity, the data was checked for whether there was a linear relationship between the two variables through scatterplot analysis. The scatterplot graph that emerged from the analysis revealed a linear relationship between the two variables. Though the graph revealed linearity, three cases fell outside the oval form that the graph displayed, which were perceived as possible outliers to linearity; thus, these three cases were removed from the data. The scatterplot analysis after the deletion of the outlier cases revealed the following graph (Figure 2), which indicated that the data met the linearity criterion for regression analysis.

Figure 2

Linearity of the Data for Regression Analysis



The distribution of residuals was checked to see whether there were any outlier values that may affect the analysis. The residual statistics were checked for the two models separately. The residual statistics for the model where the Motivation to Teach Scale is the dependent variable showed that the Cook's Distance values were lower than 1, which signaled there were no problematic values (Tabachnick & Fidell, 2013). Since there was only one dependent variable for each model, the critical value for the Mahalanobis Distance is calculated as 13,82 (Pallant, 2016). As the Mahalanobis Distance did not exceed this value, it was assumed that the values were within normal range. However, the Std. Residual values indicated that there were possible outlier values that may affect the model as the minimum value for the Std. Residual line was outside the -3,3 to +3,3 range, which is the appropriate range for sample sizes lower than 1000 observations (Tabachnick & Fidell, 2013). These possible outlier values were then checked in the Casewise Diagnostics table. The residuals statistics indicated that residual values for the model where the EFL-TPACK Scale is the dependent variable did not have any outlier values. The Cook's Distance, the Mahalanobis Distance and Std. Residual values were all within desired range for the model.

The Casewise Diagnostics table for the model with the Motivation to Teach Scale as the dependent variable listed three cases as outliers. Two of these cases were outside the desired range of -3,3 and +3,3 values for Std. Residual values (Tabachnick & Fidell, 2013). The third case was close to the upper limit. Thus, the three cases in lines 263, 265 and 287 listed on the Casewise Diagnostics values were decided to be omitted from the data. The ultimate sample size of 374 was reached after these cases were deleted. Upon removing these cases from the data, normality and linearity analyses were carried out once again. These analyses indicated that the data continued to meet the desired criteria. The residual statistics for both models also indicated that the values were within the desirable ranges for regression analysis (Table 17, Table 18).

Table 17

Residual Values for the Regression Model (Dependent: Motivation to Teach Scale)

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	36,5646	58,5721	49,8734	4,16682	374
Std. Predicted Value	-3,194	2,088	,000	1,000	374
Residual	-28,69475	23,98611	,00000	9,48888	374
Std. Residual	-3,020	2,524	,000	,999	374
Stud. Residual	-3,025	2,532	,000	1,001	374
Deleted Residual	-28,78646	24,13867	-,00173	9,54014	374
Stud. Deleted Residual	-3,059	2,551	-,001	1,005	374
Mahal. Distance	,000	10,202	,997	1,361	374
Cook's Distance	,000	,065	,003	,006	374

a. Dependent Variable: Motivation to Teach

Table 18

Residual Values for the Regression Model (Dependent: EFL-TPACK Scale)

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	172,0400	217,2892	200,7308	8,52614	374
Std. Predicted Value	-3,365	1,942	,000	1,000	374
Residual	-55,49426	53,32845	,00000	19,41611	374
Std. Residual	-2,854	2,743	,000	,999	374
Stud. Residual	-2,866	2,755	,000	1,002	374
Deleted Residual	-55,95284	53,81078	,00863	19,53458	374
Stud. Deleted Residual	-2,894	2,780	,000	1,004	374

Mahal. Distance	,000	11,323	,997	1,471	374
Cook's Distance	,000	,042	,003	,006	374

a. Dependent Variable: EFL-TPACK

In order to check whether the distribution of residuals was normal after outlier deletion, the histograms and normal P-P plots of regression standardized residuals (Figure 3) were observed for both models. The histograms for both models revealed a line close to a bell-shaped curve, meaning that the distribution was normal. The normal P-P plots (Figure 4) also indicated that the case points formed a line close to normality for both models.

Figure 3

Histograms for the Distribution of Residuals

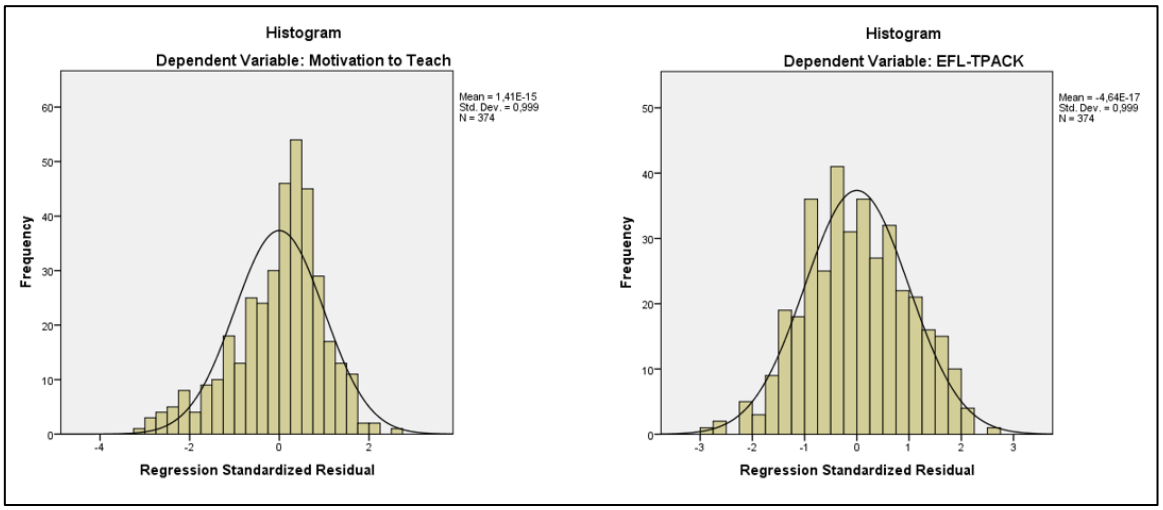
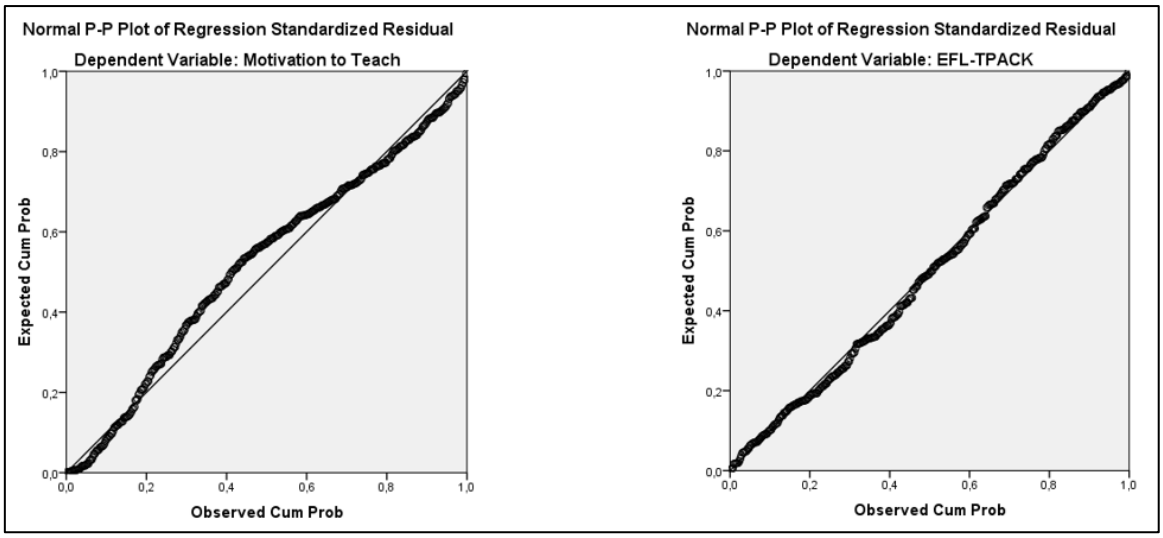


Figure 4

Normal P-P Plots of Regression Standardized Residuals



The precondition of multicollinearity was checked next. In order to check whether a multicollinearity problem exists, the tolerance values and VIF (variance inflation factors) values were observed for both models. According to Field (2013), tolerance values should not be lower than .10 while VIF values should be below 10 to indicate that there is no multicollinearity problem. Allison (1999), on the other hand, suggests that tolerance values should be higher than ,40 while VIF values should be lower than 2,50 to indicate that multicollinearity problem does not exist. VIF values significantly greater than 1 are also stated to be a signal of potential bias in regression (Field, 2013). When the tolerance and VIF values for both models were analyzed (Table 19, Table 20), it was seen that both tolerance values and VIF values were 1.000, indicating that a multicollinearity problem did not exist in the present study.

Table 19

Coefficients for the Regression Model (Dependent: Motivation to Teach Scale)

Model		Unstandardized Coefficients		t	Sig.	Collinearity Statistics	
		B	Std. Error			Tolerance	VIF
1	(Constant)	10,431	4,683	2,227	,027		
	EFL-TPACK	,196	,023	8,470	,000	1,000	1,000

a. Dependent Variable: Motivation to Teach

Table 20

Coefficients for the Regression Model (Dependent: EFL-TPACK Scale)

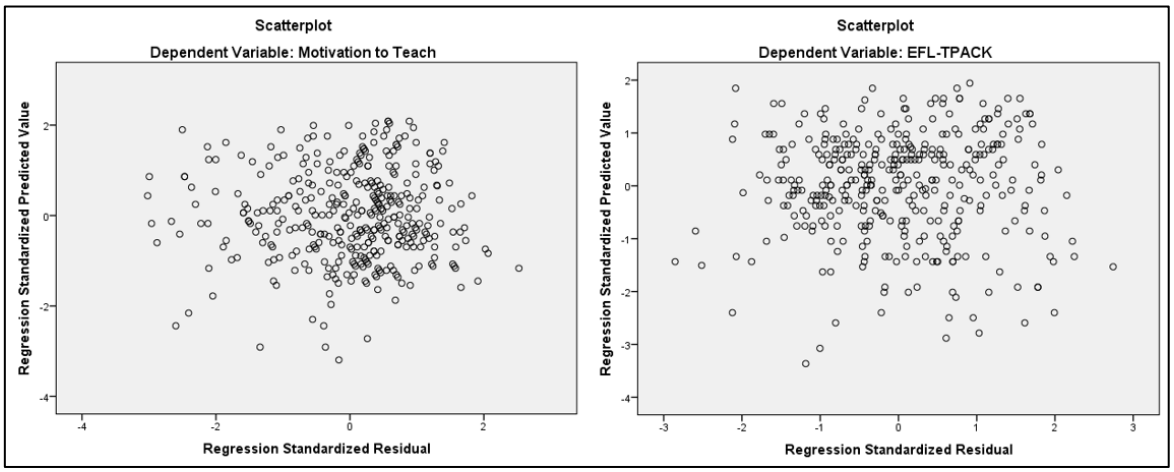
Model		Unstandardized Coefficients		t	Sig.	Collinearity Statistics	
		B	Std. Error			Tolerance	VIF
1	(Constant)	159,699	4,948	32,277	,000		
	Motivation to Teach	,823	,097	8,470	,000	1,000	1,000

a. Dependent Variable: EFL-TPACK

The assumption of homoscedasticity was checked through the scatterplots of residuals for both models (Figure 5). The scatterplots indicated homogeneity of variance. Thus, it was concluded that the assumption of homoscedasticity was not violated.

Figure 5

Scatterplots of Regression Standardized Residuals



The independence of errors was checked to ensure there were no correlations of errors. Durbin-Watson test results were checked to see whether there were any correlations between errors. Values between 1-3 are desirable while a value of 2 indicates uncorrelation of residuals (Field, 2013). As the Durbin-Watson value was around 1.8 for both models (Table 21, Table 22), it was assumed that the errors were independent. With the

independence of errors, the assumptions on the pre-conditions of regression analysis were ensured.

Table 21

Regression Model (Dependent: Motivation to Teach Scale)

			Change Statistics					
R	R Square	Adjusted R Square	R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson
,402[a]	,162	,159	,162	71,734	1	372	,000	1,812

a. Predictors: (Constant), EFL-TPACK

b. Dependent Variable: Motivation to Teach

Table 22

Regression Model (Dependent: EFL-TPACK)

			Change Statistics					
R	R Square	Adjusted R Square	R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson
,402[a]	,162	,159	,162	71,734	1	372	,000	1,801

a. Predictors: (Constant), Motivation to Teach

b. Dependent Variable: EFL-TPACK

After all necessary assumptions were checked for violations and it was ensured that the pre-conditions were met, simple linear regression analysis was adopted for revealing the relation between pre-service EFL teachers' TPACK and their motivation to teach. Simple linear regression analysis was used twice for the two models where the two scales were used separately as dependent variables in each model (Table 21, Table 22). The Motivation to Teach Scale was adopted as the dependent variable in the first model while the EFL-TPACK Scale was used as the dependent variable in the second model. This method was followed as regression analysis reveals different results based on the placement of variables in terms of which variable is placed in which role within the model. The same linear

regression analysis was done twice with two different models in order to reveal the direction of the relation between the two variables in terms of which variable better predicts the other variable.

The Pearson Correlation coefficient for both models resulted in a ,402 value (Table 23), which indicated that there was a moderate positive correlation between the Motivation to Teach total scores and EFL-TPACK total scores (Field, 2013). The correlation of these two variables was also observed to be meaningful and statistically significant as the analysis resulted in a significance level of ,000 (p<0,05). The ANOVA table for both models also revealed a significance level of ,000, which supported the observation that both models were meaningful and statistically significant.

Table 23

Correlation Coefficient for EFL-TPACK and Motivation to Teach

		Motivation to Teach	EFL-TPACK
Pearson Correlation	Motivation to Teach	1,000	,402
	EFL-TPACK	,402	1,000
Sig. (1-tailed)	Motivation to Teach	.	,000
	EFL-TPACK	,000	.

The regression analysis model for both variables revealed an R square of ,162. The adjusted R square value was close to this result with a value of ,159. This indicated that the independent variable in each model could explain about 16% of the variance in the dependent variable (Table 21, Table 22). The regression models also revealed that the regression coefficient for both constants and independent variables were statistically significant (p<0,05) (Table 19, Table 20). The regression coefficient in the models yielded positive values. The regression coefficient for EFL-TPACK Total was ,196 (Table 19) while the regression coefficient for Motivation to Teach total scores was ,823 (Table 20). These values implied that the regression models were meaningful and that the independent variable in each model could predict the dependent variable in a positive and meaningful

way, though the predictive power they had on each other is small based on the adjusted R square values. On the other hand, the impact of motivation to teach over TPACK was concluded to be relatively higher in comparison to the impact of TPACK over motivation to teach since the regression coefficient value was higher in that model (Table 19, Table 20). Based on these analyses, it was concluded that EFL-TPACK total scores and Motivation to Teach total scores could predict each other in a meaningful and positive way, though the predictive power of the variables in relation to each other was low due to the R square value results.

Findings of Qualitative Data

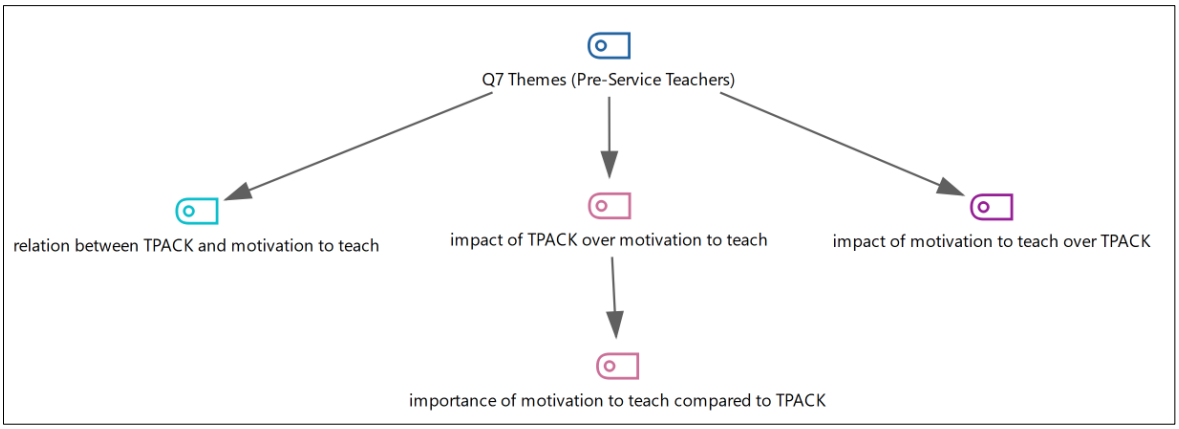
The analysis of qualitative data was carried out following the procedure of thematic analysis described by Braun & Clarke, 2006 as specified in the methodology chapter. The qualitative data to be analyzed for the main research question consisted of the final questions on the semi-structured interview forms of pre-service teachers and academics. The seventh question on pre-service teachers' semi-structured interview form and the sixth question on academics' semi-structured interview form were utilized. The analysis of the data collected from pre-service teachers and academics was carried out separately.

Pre-service teachers' views on the relationship between their TPACK and their motivation to teach. In order to uncover pre-service teachers' views on the relationship between their TPACK and their motivation to teach, the responses given to the seventh question in the semi-structured interview form of pre-service teachers was analyzed. The question was formulated as "How do you define the relationship between your TPACK and your motivation to teach? Do you think there is a relationship between them? If so, how do they relate to each other?". The responses of the pre-service teachers were coded following thematic analysis procedures. The coded extracts were then analyzed to reveal any themes emerging from the data. Through this analysis, three themes emerged within the coded extracts of pre-service teachers' responses. These themes were named as (1) relation between TPACK and motivation to teach, (2) impact of motivation to teach over TPACK,

and (3) impact of TPACK over motivation to teach (Figure 6). The themes are presented below following the order based on the frequency of each theme within the coded extracts.

Figure 6

Themes for the Seventh Interview Question on Pre-Service Teachers' Interview Form



The most prevalent theme that emerged from the analysis of the coded extracts was named as "relation between TPACK and motivation to teach". The theme involved coded extracts which consisted of pre-service teachers' statements denoting a mutual relationship between the two phenomena. In these extracts, the pre-service teachers did not specify which phenomenon had an impact over the other one. In their statements, pre-service teachers referred to a mutual relation, a strong relationship, or a connection between their TPACK and their motivation to teach.

Sample Extract 1 on relation between TPACK and motivation to teach:

I think, I think there's a relationship between them because I don't think they can be considered separately from each other. (19 Mayıs University Group Interview, Student B)

Sample Extract 2 on relation between TPACK and motivation to teach:

Also, I think it's a very uhh very strong relationship between TPACK and motivation. (Kocaeli University Group Interview 2, Student A)

Sample Extract 3 on relation between TPACK and motivation to teach:

I define the relationship between my TPACK and my motivation to teach as beneficial and positive. (Sakarya University Group Interview, Student A)

The second theme that emerged from the analysis was named as “impact of motivation to teach over TPACK”. The pre-service teachers referred to a relation between their motivation to teach and TPACK stating that their motivation to teach influenced their TPACK. Two cases of pre-service teachers’ statements referred to the importance of motivation to teach rather than its impact. These cases were treated as a sub-theme for impact of motivation to teach over TPACK and the sub-theme was named as “importance of motivation to teach compared to TPACK”.

Sample Extract 1 on impact of motivation to teach over TPACK:

If you are motivated to teach, you are also motivated to improve your TPACK. (Kocaeli University Group Interview 1, Student A)

Sample Extract 2 on impact of motivation to teach over TPACK:

My motivation to teach uhh always makes me to do better while planning our lessons. So while doing this, I also want to do the best I can. So I try to find the best technological tools. I try to find the best ways to teach the students, like, how they can have fun? How can I umm, let's say, we will play a game umm we play a game. So how can I control them? Do the- I mean, classroom managementwise? And I also think about the, o- my content knowledge. Uhh how can I teach, the- teach my knowledge to them? Let's say they are A1 level or A2 levels. How can I talk to them in A1 or A2? So, this, I do this because I am motivated to teach them. (Sakarya University Group Interview, Student C)

Sample Extract 3 on impact of motivation to teach over TPACK (sub-theme: importance of motivation to teach compared to TPACK):

We can do without TPACK, but we cannot teach without our motivation. (Kocaeli University Group Interview 2, Student A)

The third and final theme that emerged as a result of the analysis was named as “impact of TPACK over motivation to teach”. The frequency of this theme was quite close to the second theme on the impact of motivation to teach over TPACK. The coded extracts of pre-service teachers where they referred to a relation between their motivation to teach and TPACK stating that their TPACK influenced their motivation to teach were included in

this theme. The pre-service teachers either referred to the impact of their TPACK as a whole or of different components of their TPACK over their motivation to teach in their statements.

Sample Extract 1 on impact of TPACK over motivation to teach:

Using technology improves my motivation, but uh, lack of content knowledge diminishes it, and it so means the content and technology has great impact (on) my motivation. Because sometimes if you have the knowledge of technology, you cannot use it on your classes. If you even have the content knowledge, you cannot use it, it's it can be about it, TPACK itself, but it pretty affects your motivation. (Hacettepe University Group Interview, Student A)

Sample Extract 2 on impact of TPACK over motivation to teach:

Like if our TPACK is high then it affects our motivation as we feel more confident and more comfortable in the class as teachers. (Kocaeli University Group Interview 2, Student C)

Sample Extract 3 on impact of TPACK over motivation to teach:

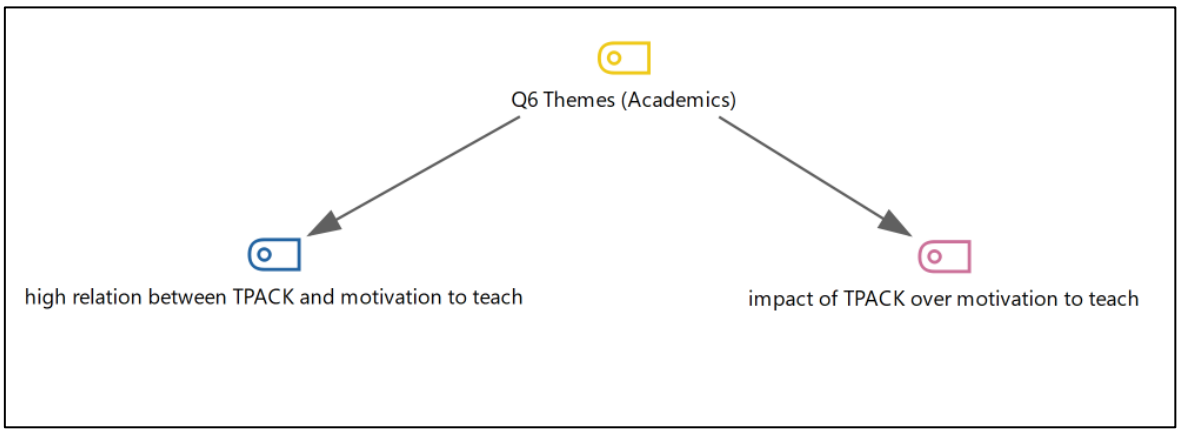
I developed a lot and I think it's raising my motivation to teach because as I'm exposed to a lot of content as well, I'm saying this because I was also insecure about my content knowledge. I feel more motivated. (Hacettepe University Group Interview, Student B)

Academics' views on the relationship between their students' TPACK and their motivation to teach. To reveal academics' views on the relationship between their students' TPACK and their motivation to teach, the responses given to the sixth question in the semi-structured interview form of academics was analyzed. The question was formulated as "How do you define the relationship between your students' TPACK and their motivation to teach? Do you think there is a relationship between their TPACK and their motivation to teach? If so, how do they relate to each other?". The responses of academics were coded following the same thematic analysis procedure adopted for pre-service teachers' responses. The analysis of the coded extracts exposed two themes in academics' responses to the semi-structured interview question. The themes were named as (1) high

relation between TPACK and motivation to teach and (2) impact of TPACK over motivation to teach (Figure 7). The themes are presented below following the order based on the frequency of each theme within the coded extracts.

Figure 7

Themes for the Sixth Interview Question on Academics' Interview Form



"High relation between TPACK and motivation to teach" was quite frequently observed compared to the second theme. This theme involved coded extracts on academics' statements referring to a mutual and positive relationship between their students' TPACK and their motivation to teach. Academics did not state which phenomenon had an impact over the other one in their statements placed within this theme. Like pre-service teachers, academics denoted a mutual relation, a strong relationship, or a connection between their students' TPACK and their motivation to teach. The reason why this theme included the phrase "high relation" instead of "relation" was that academics emphasized the strength of the relation between these two phenomena in most of their statements in the coded extracts.

Sample Extract 1 on high relation between TPACK and motivation to teach:

There is a close relationship between TPACK and motivation. (Atatürk University Academic Interview)

Sample Extract 2 on high relation between TPACK and motivation to teach:

So I believe they are connected. I cannot imagine the opposite version I mean, they are connected. (Pamukkale University Academic Interview)

Sample Extract 3 on high relation between TPACK and motivation to teach:

There is of course a quite big I mean relationship between these two. Yes, I, I think there is a, of course relationship between these two. (Bartın University Academic Interview 1)

The second theme that emerged from the analysis of the coded extracts of academics' responses was named as "impact of TPACK over motivation to teach". The frequency of the coded extracts placed under this theme was quite close to the first theme. In these extracts, academics highlighted the influence that their students' TPACK had on their motivation to teach. They either referred to TPACK as a whole or mentioned different components of it when describing its influence over their students' motivation to teach.

Sample Extract 1 on impact of TPACK over motivation to teach:

So I can say that just because they had they were quite competent in those areas, I mean TPACK components, let's say. They also were motivated. For me, it is too much related of course, because if you do not have enough pedagogical knowledge in your area, for example, you cannot be motivated to, to teach. (Bartın University Academic Interview 1)

Sample Extract 2 on impact of TPACK over motivation to teach:

So, they are so much used to the use of technology that if we ourselves use technology in our teacher education courses as well as teach them how to use it, this may positively affect their motivation, I believe. (Hacettepe University Academic Interview)

Sample Extract 3 on impact of TPACK over motivation to teach:

The ones, the teacher candidates, I mean the ones with the highest levels of TPACK are the ones who are already highly motivated. They are integrated I guess, because you know, if a teacher candidate has no problems with pedagogical issues, I mean, class control or with giving clear instructions or by drawing students' attention, these are the ones who are already motivated teacher candidates. Who do, who, who want to do their best in their classes. (Pamukkale University Academic Interview)

Apart from the coded extracts that were placed within the themes presented here, two separate cases occurred within the data that were determined to be outliers. In one

coded case, one academic articulated that he was not sure whether his students' TPACK and motivation to teach were related. In another case, another academic stated that her students' motivation to teach had an impact over their TPACK in contrast with the statements of the majority of the academics.

Research Question 2: What is pre-service EFL teachers' level of motivation to teach?

In order to reveal pre-service teachers' level of motivation to teach, the Motivation to Teach Scale results were analyzed along with the intrinsic motivation and extrinsic motivation subscale results. The purpose of analyzing the intrinsic and extrinsic motivation subscale results was to reveal whether there was a statistically significant difference between the results of pre-service teachers regarding these two subscales. The mean scores of pre-service teachers were checked to reveal the motivation levels based on each scale. After this, the percentage of their scores compared to the total possible points were calculated in order to determine the ratio of the points obtained from each scale. Following these analyses, the intrinsic motivation and extrinsic motivation subscale means were compared to reveal whether there was a significant difference between these two motivation levels of pre-service EFL teachers. Finally, the Motivation to Teach Scale results by geographical region were analyzed in order to determine whether there was a statistically significant difference between the motivation levels of pre-service EFL teachers in different geographical regions.

The normality analysis for the Motivation to Teach Scale was carried out at the beginning of the analysis process, and it was concluded that the data was normally distributed. As the subscales were also analyzed for this research question, the normality of the intrinsic motivation and extrinsic motivation subscales were checked prior to the analysis. As in the case of the Motivation to Teach Scale, the Kolmogorov-Smirnov test yielded a 0,000 result for both the intrinsic motivation and extrinsic motivation subscales (Table 24). Since the data sample was bigger than 100 observations (Mishra et al., 2019), this was not directly accepted as a violation of normality The mean values, the 5% trimmed

mean values, skewness and kurtosis values along with the Q-Q plots were analyzed in order to determine whether the data collected through these two subscales were normally distributed (Table 25).

Table 24

Normality Tests for Intrinsic and Extrinsic Motivation Subscales

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
IntrinsicMean	,097	374	,000	,960	374	,000
ExtrinsicMean	,093	374	,000	,978	374	,000

a. Lilliefors Significance Correction

The analysis of the mean and 5% trimmed mean values showed that the difference between the two means were -0,05 and -0,03 for the intrinsic motivation subscale and the extrinsic motivation subscale, respectively, indicating that the difference was quite small. The skewness and kurtosis levels were also within the range of -1,5 and +1,5, which is accepted as normal (Tabachnick & Fidell, 2013).

Table 25

Descriptive Statistics for Intrinsic and Extrinsic Motivation Subscales

		Statistic	Std. Error
Intrinsic Motivation	Mean	4,1447	,05123
	5% Trimmed Mean	4,1928	
	Std. Deviation	,99066	
	Skewness	-,705	,126
	Kurtosis	,163	,252
Extrinsic Motivation	Mean	4,1721	,04344
	5% Trimmed Mean	4,2001	
	Std. Deviation	,84015	
	Skewness	-,532	,126
	Kurtosis	,303	,252

The analysis of the Q-Q plots for the subscales revealed that there were not any significant deviations from normality, indicating a normal distribution. Along with these plots,

the histograms also revealed distributions close to bell-curve shapes. Based on the analyses of these parameters, it was concluded that the subscales also had normal distribution.

To obtain a comprehensive insight into the participating pre-service EFL teachers' levels of motivation to teach, a detailed analysis was carried out to determine the mean scores earned by the pre-service teachers. An analysis was also carried out to determine the percentage of their scores on each scale relative to the total possible points attainable from the scales. These analyses were performed for the total scores of the pre-service teachers, as well as for their separate scores in the intrinsic and extrinsic motivation scales. It should be highlighted that the maximum points that can be reached for the Motivation to Teach Scale is 72 points, while the highest obtainable scores for the corresponding subscales of intrinsic and extrinsic motivation are 42 points and 30 points, respectively. The analysis revealed that the mean value for the total scores obtained by the pre-service EFL teachers on the Motivation to Teach Scale was determined to be 49,87 out of a maximum possible score of 72 with a standard deviation of 10,36 (Table 26). The mean value for the total scores pertaining to the intrinsic motivation subscale was found to be 29 out of a total 42 points with a standard deviation of 6,93, while the mean value for the total scores related to the extrinsic motivation subscale was calculated to be 20,86 out of a total of 30 points with a standard deviation of 4,20.

Following the analysis of the mean values for the total scores from the Motivation to Teach Scale as well as the intrinsic motivation and extrinsic motivation subscales, the percentages of the scores were also analyzed. The purpose for this analysis was to reveal the ratio of the scores obtained by the pre-service teachers to the total attainable points. The analysis revealed that the percentage of the total scores on the Motivation to Teach Scale compared to the maximum possible scores was 69, with a standard deviation of 14,39. Similarly, the percentage for the intrinsic motivation scale was 69 and the percentage for the extrinsic motivation scale 69,5 (Table 27). The standard deviations for the scores attained in these two subscales were 16,5 and 14, respectively. The analysis indicated that

the percentages of the scores relative to the maximum possible scores, as well as the corresponding standard deviation values, were comparable across the different measures.

Table 26

Mean Values and Range of Pre-Service Teachers' Scores on the Motivation to Teach Scale

	N	Mean		Std. Deviation	Variance
	Statistic	Statistic	Std. Error	Statistic	Statistic
Motivation to Teach	374	49,8734	,53588	10,36346	107,401
Intrinsic Motivation	374	29,0128	,35858	6,93460	48,089
Extrinsic Motivation	374	20,8606	,21722	4,20077	17,646

Table 27

Percentages of the Scores against the Total Possible Scores on the Motivation to Teach Scale

	N	Mean		Std. Deviation	Variance
	Statistic	Statistic	Std. Error	Statistic	Statistic
Motivation to Teach	374	69,2686	,74428	14,39370	207,178
Intrinsic Motivation	374	69,0781	,85376	16,51096	272,612
Extrinsic Motivation	374	69,5352	,72406	14,00257	196,072

As the analysis of the normality demonstrated that the data had normal distribution, it was deemed appropriate to adopt paired samples t test in order to reveal whether there was a significant difference between pre-service EFL teachers' intrinsic and extrinsic motivation means. The analysis of the paired samples statistics indicated that the results of the intrinsic motivation subscale yielded a mean value of 4,14 (Table 28). Similarly, the mean value for the extrinsic motivation subscale outcomes was just slightly up at 4,17. Moreover, the correlation coefficient that denotes the association between the mean values of these two subscales was determined to be 0,715. Accompanied by a significance level of 0,000, this indicated a positive correlation between the results, emphasizing that this correlation is statistically meaningful. The analysis of the paired-samples t test results showed a difference of -0,027 between the mean scores of the intrinsic motivation subscale

and the extrinsic motivation subscale, with a standard error mean of 0,036 (Table 29). The calculated t value corresponding to the mean difference was determined to be -0,752. Furthermore, with the significance value of 0,452, the results suggested that the difference noted in mean values between the intrinsic and extrinsic motivation subscales was not statistically significant (p > 0,05). Consequently, the null hypothesis could not be refuted in light of these results. As the difference between the mean values was established as statistically insignificant, the effect size was not calculated.

Table 28

Paired Samples Statistics for Intrinsic and Extrinsic Motivation Means

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	IntrinsicMean	4,1447	374	,99066	,05123
	ExtrinsicMean	4,1721	374	,84015	,04344

Table 29

Paired Samples Test for Intrinsic and Extrinsic Motivation Means

		Paired Differences					
		Mean	Std. Deviation	Std. Error Mean	t	df	Sig. (2-tailed)
Pair 1	Intrinsic Motivation – Extrinsic Motivation	-,02742	,70484	,03645	-,752	373	,452

The final analysis carried out while determining pre-service EFL teachers' levels of motivation to teach was to investigate whether there was a significant difference between their scores according to geographical regions. The normality of the data collected through the Motivation to Teach Scale was checked according to geographical regions in order to identify whether a parametric or non-parametric test was required for the analysis. The analysis indicated that the data was not normally distributed. Though the skewness and kurtosis values for each region were within the normal range of -1,5 and +1,5 (Tabachnick & Fidell, 2013), the other parameters signaled deviations from normality. The Shapiro-Wilk test results were checked for normality since groups with sample sizes less than 50 were

present within the data based on geographical regions. The results indicated that the data from three of the regions did not have normal distribution as the value was lower than 0,05. Deviations from normality were also observed in the Q-Q plots and histograms of some of the geographical regions. Thus, the Kruskal Wallis test was adopted instead of the one-way ANOVA test, which is its parametric counterpart.

Table 30

Kruskal Wallis Test for the Motivation to Teach Score Distribution by Geographical Region

	Motivation to Teach
Chi-Square	2,319
df	6
Asymp. Sig.	,888

a. Kruskal Wallis Test

b. Grouping Variable: Geographical region of the university

The mean rank values for each geographical region were checked first, which indicated that the Mediterranean Region had the highest mean rank with 199, followed by the Eastern Anatolia Region. The second lowest mean rank belonged to the Marmara Region, with the Aegean region having the lowest mean rank. The result of the Kruskal Wallis test showed that the Chi-Square value was calculated as 2,319 with a significance value of ,888. As the significance value analysis revealed a value above 0,05, the difference between the motivation to teach scores of the group were found to be not statistically significant (Table 30). Thus, the null hypothesis could not be refuted. Since the difference between the scale scores by geographical regions was found to be statistically insignificant, post-hoc tests and effect size tests were not performed.

Research Question 3: What is pre-service EFL teachers' level of technological pedagogical content knowledge?

For the purpose of revealing pre-service EFL teachers' level of technological pedagogical content knowledge, the EFL-TPACK Scale results were analyzed along with the PCK and TPCK subscale results. The subscale results were analyzed in order to reveal whether pre-service teachers' PCK and TPCK, which are content-specific synthesized knowledge bases (Wang, 2022), differed from each other. Along with these analyses, the mean scores of pre-service teachers were also checked to reveal the mean levels of TPACK, PCK, and TPCK. The percentage of pre-service teachers' scores in comparison to the total possible points attainable from each scale was also checked to uncover the ratio of the scores of the pre-service teachers. After this, the PCK and TPCK subscale means of pre-service teachers were compared to showcase whether the results differed in a statistically meaningful manner, hoping that the result may provide insights into the significance of the technology knowledge aspect of pre-service EFL teachers' TPACK. Lastly, as in the case of the Motivation to Teach Scale, the EFL-TPACK Scale results by geographical region were analyzed in order to determine whether there was a statistically significant difference between the TPACK levels of pre-service EFL teachers in different geographical regions.

The normality of the data from the EFL-TPACK Scale was analyzed prior to the analysis as explained in the data analysis section (Table 31). Considering the results of the normality parameters, it was concluded that the data from the EFL-TPACK Scale was normally distributed. Thus, only the normality of the subscales was analyzed for this research question prior to the analysis. The Kolmogorov-Smirnov test result for the PCK and TPCK subscales revealed significance levels of 0,049 and 0,002, respectively. Though the result for the TPCK subscale was below the 0,05-significance level this was not directly perceived as a violation of normality due to the size of the sample (Mishra et al., 2019). The other parameters of normal distribution were checked to determine the normality of the data.

Table 31

Tests of Normality for PCK and TPCK Subscales

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
PCK	,047	374	,049	,986	374	,001
TPCK	,061	374	,002	,982	374	,000

a. Lilliefors Significance Correction

The analysis of the mean and 5% mean values revealed a 0,005-point difference for the PCK subscale and a 0,01-point difference for the TPCK subscale, meaning that the difference was quite small and that the data did not involve outliers disrupting the normality (Table 32). The skewness and kurtosis levels for both subscales were within the range of -1,5 and +1,5, which is accepted as an indicator of normal distribution (Tabachnick & Fidell, 2013).

Table 32

Descriptive Statistics for PCK and TPCK Subscales

		Statistic	Std. Error
PCK	Mean	4,1217	,02331
	5% Trimmed Mean	4,1268	
	Std. Deviation	,45074	
	Skewness	-,060	,126
	Kurtosis	-,125	,252
TPCK	Mean	4,0777	,02512
	5% Trimmed Mean	4,0889	
	Std. Deviation	,48589	
	Skewness	-,164	,126
	Kurtosis	-,189	,252

The Q-Q plots for the subscales were also analyzed to see whether the data had normal distribution. The analysis revealed that there were not any significant deviations from normality, indicating a normal distribution. Along with these plots, the histograms were analyzed for data distribution, which revealed distributions close to bell-curve shapes.

Based on the analyses of these parameters, it was concluded that the subscales had normal distribution like the EFL-TPACK Scale itself.

In order to determine the TPACK levels of pre-service EFL teachers, the mean scores based on the total points as well as the percentages of the total points against the possible maximum points on the scales were calculated first (Table 33). Analyses were carried out both for the total scores on the EFL-TPACK Scale and its subscales. The maximum attainable score from the EFL-TPACK Scale is 245, with the highest attainable scores for the PCK and the TPCK subscales being 105 and 140, respectively. Through the analysis of the total scores, it was observed that the mean value for the total scores in the EFL-TPACK Scale was 200,7 out of a maximum score of 245, with a standard deviation of 21,20. The mean value for the total scores regarding the PCK subscale was calculated to be 86,55 out of 105 with a standard deviation of 9,45, while the mean value for the total scores on the TPCK subscale was 114,17 out of 140 with a standard deviation of 13,6. To reveal the ratio of the scores obtained by the pre-service teachers to the total attainable scores, the percentages of the total scores on the EFL-TPACK Scale were analyzed. The analysis of the percentages showed that the percentage of the total scores on the EFL-TPACK Scale compared to the maximum possible scores was 81,93, with a standard deviation of 8,65. The percentage of the scores on the PCK subscale compared to the maximum possible scores was 82,43, with a standard deviation of 9,01 (Table 34). Likewise, the percentage of the scores on the TPCK subscale compared to the maximum possible scores was 81,55, with a standard deviation of 9,71. Similar to the results of the percentages of the scores obtained in the Motivation to Teach Scale, the analysis of the percentages of the scores obtained in the EFL-TPACK Scale indicated that the percentages of the scores relative to the maximum possible scores, as well as the corresponding standard deviation values, were comparable across the different measures.

Table 33

Mean Values and Range of Pre-Service Teachers' Total Scores in the EFL-TPACK Scale

	N	Mean	Std. Deviation	Variance	Skewness		Kurtosis	
		Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
EFL-TPACK	374	200,7308	21,20567	449,680	-,086	,126	-,128	,252
PCK	374	86,5558	9,46564	89,598	-,060	,126	-,125	,252
TPCK	374	114,1749	13,60495	185,095	-,164	,126	-,189	,252

Table 34

Percentages of the Scores against the Total Possible Scores for the EFL-TPACK Scale

	N	Mean	Std. Deviation	Variance	Skewness		Kurtosis	
		Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
EFL-TPACK	374	81,9309	8,65537	74,915	-,086	,126	-,128	,252
PCK	374	82,4341	9,01490	81,268	-,060	,126	-,125	,252
TPCK	374	81,5535	9,71782	94,436	-,164	,126	-,189	,252

To uncover whether the pre-service EFL teachers' PCK and TPCK subscale means had a statistically significant difference, paired samples t test was adopted. This test was adopted as the normality analysis conducted earlier showed that the data had normal distribution. The analysis of the paired samples statistics revealed that the results of the pre-service EFL teachers in the PCK subscale yielded a mean value of 4,14, whereas the results in the TPCK subscale yielded a mean value of 4,07 (Table 35). The correlation coefficient of the mean values of the two subscales produced a 0,679 result along with a significance value of 0,000. This indicated a positive correlation between the results, with the correlation being moderately meaningful. The analysis of the paired samples t test revealed that there was a 0,44 difference between the PCK and TPCK mean scores of the pre-service EFL teachers, with a standard error mean of 0,019. The calculated t value corresponding to the mean difference was observed as 2,262 (Table 36). As the significance value was calculated to be 0,024, the difference noted in mean values between the PCK and TPCK subscales was determined to be statistically significant ($p < 0,05$). As a

result, the null hypothesis was refuted in light of the findings of this analysis. For the effect size of the paired samples t test, Cohen's d was checked (Table 37). The effect size calculated for the paired sample t test was calculated as 0,117, which showed that the effect size was small since the d value was below 0,2 (Cohen, 1988).

Table 35

Paired Samples Statistics for PCK and TPCK Means

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	PCK	4,1217	374	,45074	,02331
	TPCK	4,0777	374	,48589	,02512

Table 36

Paired Samples Test for PCK and TPCK Means

		Paired Differences					
		Mean	Std. Deviation	Std. Error Mean	t	df	Sig. (2-tailed)
Pair 1	PCK-TPCK	,04403	,37638	,01946	2,262	373	,024

Table 37

Paired Samples Test Effect Size for PCK and TPCK Means

					95% Confidence Interval	
			Standardizer[a]	Point Estimate	Lower	Upper
Pair 1	PCK-TPCK	Cohen's d	,37638	,117	,015	,219

a. The denominator used in estimating the effect sizes.

Cohen's d uses the sample standard deviation of the mean difference.

Hedges' correction uses the sample standard deviation of the mean difference, plus a correction factor.

While exploring pre-service EFL teachers' TPACK levels, the last analysis carried out was to determine whether there was a significant difference between the EFL-TPACK

scores according to geographical region (Table 38). In order to identify whether a parametric or nonparametric test was required, the normality of the data was tested first. The analysis revealed that the kurtosis value and the Shapiro-Wilk test for the Mediterranean Region were not within normal range. The boxplot for the Mediterranean Region revealed that there was an extreme value and outlier values. The extreme value and two outlier values were removed from the data set for this particular test and the normality was checked once again. The analysis of the normality showed that the mean values and 5% trimmed mean values of each region were close to each other with the skewness and kurtosis levels being within the normal range of -1,5 and +1,5 (Tabachnick & Fidell, 2013).

Table 38

Descriptive Statistics for the EFL-TPACK Scores by Geographical Region

Geographical region of the university		Statistic	Std. Error
Eastern Anatolia Region	Mean	200,5801	2,63169
	5% Trimmed Mean	200,8243	
	Std. Deviation	21,70145	
	Skewness	-,002	,291
	Kurtosis	-,546	,574
Central Anatolia Region	Mean	204,2160	2,34702
	5% Trimmed Mean	204,0734	
	Std. Deviation	20,99236	
	Skewness	,151	,269
	Kurtosis	-,935	,532
Black Sea Region	Mean	200,6185	2,43279
	5% Trimmed Mean	200,9328	
	Std. Deviation	21,20854	
	Skewness	-,092	,276
	Kurtosis	,120	,545
Mediterranean Region	Mean	203,1918	3,26239
	5% Trimmed Mean	204,5465	
	Std. Deviation	20,63315	
	Skewness	-1,170	,374
	Kurtosis	3,322	,733
Aegean Region	Mean	201,1333	4,25447
	5% Trimmed Mean	201,5556	
	Std. Deviation	23,30271	

	Skewness	-,172	,427
	Kurtosis	-,032	,833
Marmara Region	Mean	190,1823	3,58235
	5% Trimmed Mean	189,5853	
	Std. Deviation	21,49412	
	Skewness	,498	,393
	Kurtosis	,680	,768
Southeastern Anatolia Region	Mean	200,9394	2,70837
	5% Trimmed Mean	201,0994	
	Std. Deviation	17,96530	
	Skewness	-,033	,357
	Kurtosis	-,559	,702

For testing normality, the Shapiro-Wilk test was checked as the sample sizes for the majority of the regions were below 50. The tests of normality for the EFL-TPACK scores by geographical region also showed that the data is normally distributed since the significance value for each region was above 0,05 level (Table 39). The Q-Q plots and histograms of each region also signaled normal distribution since the Q-Q plots results did not indicate significant deviations from normality and the histograms revealed distributions close to bell-shaped curves. Since the data was concluded to have normal distribution, a one-way ANOVA test was carried out to determine whether the TPACK levels of pre-service EFL teachers differed based on geographical regions.

Table 39

Tests of Normality for the EFL-TPACK Scores by Geographical Region

Geographical region of the university	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Eastern Anatolia Region	,095	68	,200*	,974	68	,167
Central Anatolia Region	,097	80	,060	,969	80	,052
Black Sea Region	,052	76	,200*	,984	76	,470
Mediterranean Region	,153	40	,019	,912	40	,005
Aegean Region	,091	30	,200*	,983	30	,890
Marmara Region	,125	36	,165	,956	36	,165
Southeastern Anatolia Region	,068	44	,200*	,979	44	,585

The Levene test indicated that the homogeneity of variances was achieved based on all measures (Table 40). Thus, the ANOVA test result instead of the Welch test result was analyzed in order to determine whether there was any difference between the TPACK levels of pre-service teachers based on geographical regions. The ANOVA test result revealed a significance value of 0,034 (Table 41), meaning that there was a statistically significant difference between TPACK levels of pre-service teachers in different geographical regions.

Table 40

Tests of Homogeneity for the EFL-TPACK Scores by Geographical Region

		Levene Statistic	df1	df2	Sig.
EFL-TPACK	Based on Mean	2,070	6	364	,056
	Based on Median	1,994	6	364	,066
	Based on Median and with adjusted df	1,994	6	343,436	,066
	Based on trimmed mean	2,077	6	364	,055

Table 41

ANOVA for the EFL-TPACK Scores by Geographical Region

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	5795,356	6	965,893	2,301	,034
Within Groups	152783,987	364	419,736		
Total	158579,342	370			

As the ANOVA test provided meaningful results, the effect size and post hoc tests were also performed. The effect size was checked through the eta squared value, which provided a result of 0,037 for the proportion of variation in TPACK levels based on geographical regions (Table 42). As the eta squared value was less than 0,06, it was understood that the effect size is small (Cohen, 1988). While the effect size of the variation was small, post hoc test was still performed to uncover which geographical regions showed

statistically significant differences in the mean values of pre-service EFL teachers' total scores in the EFL-TPACK Scale.

Table 42

ANOVA Effect Sizes for the EFL-TPACK Scores by Geographical Region

			95% Confidence Interval	
		Point Estimate	Lower	Upper
EFL-TPACK	Eta-squared	,037	,000	,066
	Epsilon-squared	,021	-,016	,051
	Omega-squared Fixed-effect	,021	-,016	,050
	Omega-squared Random-effect	,003	-,003	,009

a. Eta-squared and Epsilon-squared are estimated based on the fixed-effect model.

b. Negative but less biased estimates are retained, not rounded to zero.

Table 43

Gabriel's Test for the EFL-TPACK Scores by Geographical Region

(I) Geographical region of the university	(J) Geographical region of the university	Mean Difference (I-J)	Std. Error	Sig.
Central Anatolia Region	Eastern Anatolia Region	3,63596	3,37924	,999
	Black Sea Region	3,59754	3,28170	,999
	Mediterranean Region	-1,23458	4,07320	1,000
	Aegean Region	3,08270	4,38610	1,000
	Marmara Region	14,03371*	4,11170	,012
	Southeastern Anatolia Region	3,27660	3,84528	1,000
Mediterranean Region	Eastern Anatolia Region	4,87054	4,18531	,997
	Central Anatolia Region	1,23458	4,07320	1,000
	Black Sea Region	4,83212	4,10695	,996
	Aegean Region	4,31728	5,03343	1,000
	Marmara Region	15,26829*	4,79620	,033
	Southeastern Anatolia Region	4,51118	4,56987	1,000
Marmara Region	Eastern Anatolia Region	-10,39775	4,22279	,240
	Central Anatolia Region	-14,03371*	4,11170	,012
	Black Sea Region	-10,43617	4,14514	,203

Mediterranean Region	-15,26829*	4,79620	,033
Aegean Region	-10,95101	5,06464	,480
Southeastern Anatolia Region	-10,75711	4,60422	,341

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

As the sample sizes of the geographical regions differed, Gabriel's test was adopted for multiple comparisons (Table 43). The analysis revealed that there was a statistically significant difference between the Marmara Region and the Central Anatolia Region as well as between the Marmara Region and the Mediterranean Region. It was observed that both the Central Anatolia Region and the Mediterranean Region had higher mean values compared to the Marmara Region in terms of the EFL-TPACK scores of pre-service EFL teachers.

Research Question 4: What are the views of pre-service EFL teachers regarding their TPACK and their motivation to teach?

In order to reveal the views of pre-service EFL teachers in relation to their TPACK and their motivation to teach, seven questions were adopted in the semi-structured interviews conducted with pre-service teachers. The questions adopted in the interviews were as follows:

1. How do you assess your technological pedagogical content knowledge (TPACK)? How do you define your competency level of TPACK?
2. How do you explain your effort to develop your TPACK? What do you do to develop your TPACK?
3. How do you assess the effect of your faculty courses on your TPACK? How do the courses you take at your faculty contribute to your TPACK? Apart from the courses, is there any other resource that your faculty provide to support your TPACK?
4. How do you assess your motivation to teach? How motivated are you to teach?

5. How do you define your effort to improve your motivation to teach? Is there anything you do to increase your motivation to teach?

6. How do you assess the effect of your faculty courses to your motivation to teach? How do the courses you take at your faculty contribute to your motivation to teach? Apart from the course, is there any other resource that your faculty provide to support your motivation to teach?

7. How do you define the relationship between your TPACK and your motivation to teach? Do you think there is a relationship between them? If so, how do they relate to each other?

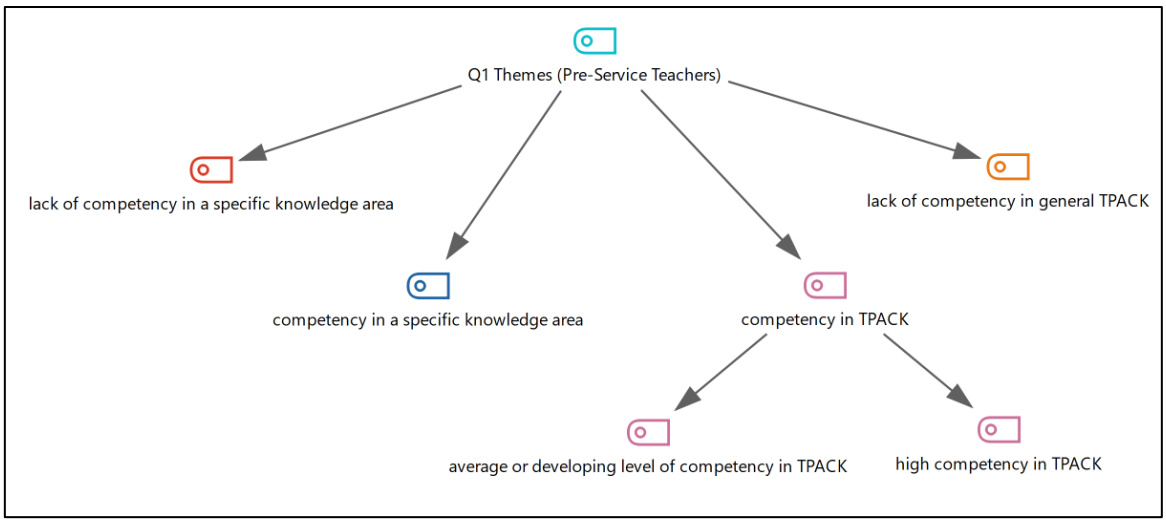
The final question on the semi-structured interview form was analyzed for the first research question while the remaining six questions were analyzed for pre-service teachers' views on their TPACK and motivation to teach. The thematic analysis process was carried out for each question separately as described in the data analysis section. After the themes for each question was determined, the frequencies of each theme were analyzed in order to reveal common themes over less common themes for ordering. The findings from the thematic analysis for each question are presented in this section in the same order as they were discussed during the interviews.

Pre-service teachers' views on their TPACK competency

To reveal pre-service EFL teachers' views on their TPACK competency level, the question adopted during the semi-structured interviews was formulated as "How do you assess your technological pedagogical content knowledge (TPACK)? How do you define your competency level of TPACK?". The analysis of the responses for this part of the interview revealed four themes that emerged from the coded extracts. The themes were named as (1) lack of competency in a specific knowledge area, (2) competency in a specific knowledge area, (3) competency in TPACK, and (4) lack of competency in general TPACK (Figure 8).

Figure 8

Themes for the First Interview Question on Pre-Service Teachers' Interview Form



The most prevalent theme that emerged from the coded extracts was "lack of competency in a specific knowledge area". This theme consisted of coded extracts where pre-service teachers referred to their perceived deficiency in a specific knowledge base of their TPACK. The codes that appeared most frequently within this theme reflected pre-service teachers' perceived lack of knowledge pertaining to technology. The subsequent most frequently emerging codes within the data were related to the perceived deficiency of pre-service teachers in their pedagogical knowledge base. Codes relating to lack of content knowledge comprised the least frequent portion of the codes within this theme.

Sample Extract 1 on lack of proficiency in a specific knowledge area:

Also the the the usage of technology is far beyond my understanding because I have a I have a I have difficulty to use technological devices in my my in my in my in my class time. Yeah. Yeah. Practicum class. Umm. Also I am working in an in an institution institution and I I have 4th class. Umm actually I do not use so much technological pedagogical content. Uh my probably my proficiency is in that is very low. (Kocaeli University Group Interview 2, Student A)

Sample Extract 2 on lack of proficiency in a specific knowledge area:

I believe that I'm lacking in the pedagogy part because. I don't know. I don't quite know how to handle the students. (Kocaeli University Group Interview 1, Student A)

While “lack of competency in a specific knowledge area” emerged as the most prevalent theme based on the coded extracts, the second common theme that appeared in the coded data was “competency in a specific knowledge area”. Strength in technology or in technological knowledge was the most frequently observed code within this theme, with its frequency surpassing the codes on lack of technological knowledge that emerged in the previous theme. Just as lack of pedagogical knowledge was the second most commonly observed code in the theme named as “lack of competency in a specific knowledge area”, strength in pedagogical knowledge occurred as the second most frequently observed code within the “competency in a specific knowledge area” theme. Strength in content knowledge appeared as the least frequent code within this theme, similar to how lack of content knowledge was the least common code within the previous theme.

Sample Extract 1 on competency in a specific knowledge area:

I think I'm good at using the technology in my lessons. (19 Mayıs University Group Interview, Student B)

Sample Extract 2 on competency in a specific knowledge area:

I'm pretty good at technology and pedagogical part. (Hacettepe University Group Interview, Student A)

The third prevalent theme that appeared based on the coded extracts of pre-service teachers’ group interviews was named as “competency in TPACK”. The codes within this theme revealed two sub-themes based on the grouping of the coded extracts. Pre-service teachers’ perceived level of general TPACK was most frequently deemed as either still in development, average or above average. The codes referring to their level of competency in this way were placed within the first sub-theme named as “average or developing level of competency in TPACK”. The second sub-theme within this theme was named as “high competency in TPACK”. Only three instances of this sub-theme were observed within the coded data.

Sample Extract 1 on competency in TPACK (Sub-theme 1: average or developing level of competency in TPACK):

I can say it's close to intermediate level, but I have to improve it, you know. (Bartın University Group Interview, Student A)

Sample Extract 2 on competency in TPACK (Sub-theme 2: high competency in TPACK):

I think I'm highly proficient in integrating technology with pedagogy and content knowledge. (Hacettepe University Group Interview, Student B)

The least commonly observed theme within the coded data on the responses of pre-service teachers to this interview question was “low level of competency in TPACK”. This theme involved coded extracts where pre-service teachers referred to their lack of competency in TPACK in general.

Sample Extract 1 on low level of competency in TPACK:

I think my uh, technological pedagogical content knowledge is low. (Kocaeli University Group Interview 2, Student B)

Sample Extract 2 on low level of competency in TPACK:

I think my TPACK level is insufficient. (Kocaeli University Group Interview 1, Student A)

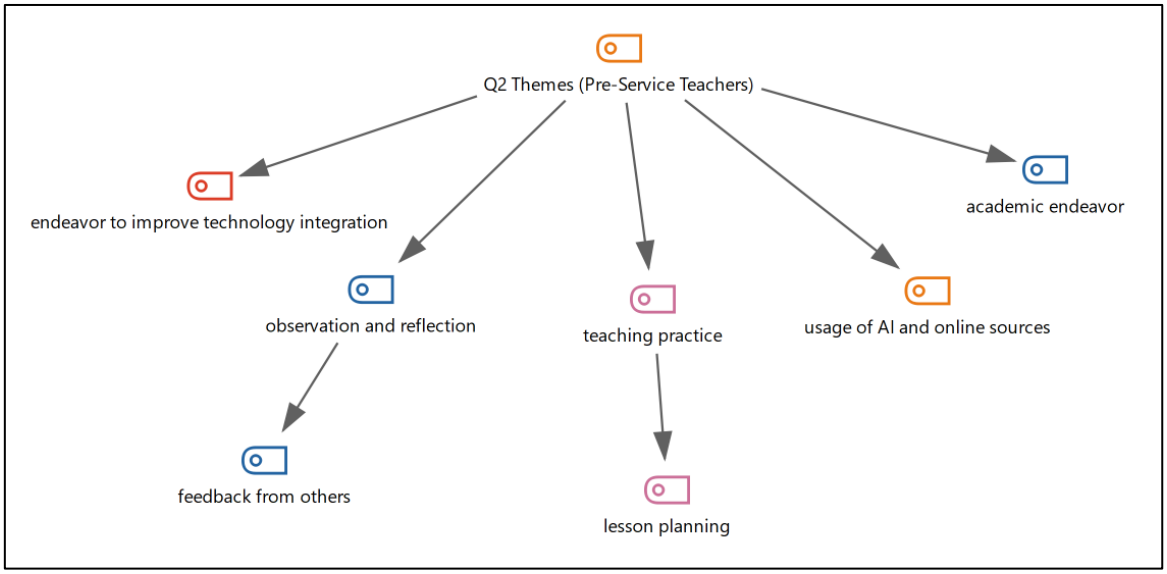
Pre-service teachers’ efforts to improve their TPACK

The question adopted during the semi-structured interviews to reveal pre-service teachers’ efforts to improve their TPACK was formulated as “How do you explain your effort to develop your TPACK? What do you do to develop your TPACK?”. The responses given by pre-service teachers were coded based on the thematic analysis process. The analysis of the coded extracts exposed five themes in relation to pre-service teachers’ effort to improve their TPACK. The themes, which were presented here in an order from the most common to least common, were named as (1) endeavor to improve technology integration, (2) observation and reflection, (3) teaching practice, (4) usage of AI and online sources, and

(5) academic endeavor (Figure 9). The analysis also revealed sub-themes for the observation and reflection theme and the teaching practice theme as well.

Figure 9

Themes for the Second Interview Question on Pre-Service Teachers' Interview Form



"Endeavor to improve technology integration" was revealed to be the most prevalent theme among the five themes determined from the coded extracts. Within the coded extracts placed under this theme were statements of pre-service teachers related to the efforts regarding technology use in the classroom. Some pre-service teachers also referred to specific technological tools that they try to adopt while others mentioned their attempts on technology integration for teaching.

Sample Extract 1 on endeavor to improve technology integration:

I think we all should improve ourselves in technological knowledge. That's why I'm trying to use AI or I'm trying to use smart board (in), effectively as much as possible and I'm trying to improve myself, umm becoming a 21 century teacher, this is how I try to develop my TPACK. (19 Mayıs University Group Interview, Student C)

Sample Extract 2 on endeavor to improve technology integration:

Uh, actually, I learned from my students how to use technology in class even more than they taught me during university. Because they are more familiar with technology than

I, than I am. So I ask them which apps do, do they use, and then I try to adopt them into my classrooms and to my classes. (Sakarya University Group Interview, Student A)

"Observation and reflection" was the second most commonly observed theme based on the coded extracts of pre-service teachers within the extracts on their efforts to improve their TPACK. The extracts of pre-service teachers on this theme involved statements such as observing their peers, watching teaching videos, and reflecting on their own teaching. This theme also entailed statements on feedback from their students, their supervisors, their practicum teachers, or their peers. As the coded extracts with these statements were considered to reflect a specific aspect of pre-service teachers' efforts on reflection, these extracts were placed under a sub-theme named "feedback from others". Together with this sub-theme, the observation and reflection theme formed the second prevalent theme on the efforts of pre-service teachers to improve their TPACK.

Sample Extract 1 on observation and reflection:

I observe more experienced teachers in my practicum classes. Like how they conduct a lesson, etcetera. And also after these classes I also reflect on what, the, the things they do in the classes and what do I do in the situation or also how to use some technological tools in the same situation etcetera, like this. (Kocaeli University Group Interview 1, Student B)

Sample Extract 2 on observation and reflection (Sub-theme: feedback from others):

I also ask the students constantly. Like, are you OK? Are you enjoying? They want to do it this way. I give options. So I try to observe which one they like more. And they say they say, like, Hocam I like this one better or the other says this one is better. This one works better for me. (Hacettepe University Group Interview, Student C)

The third prevalent theme that was observed within the coded extracts on pre-service teachers' efforts to improve their TPACK was "teaching practice". This theme involved statements of pre-service teachers where they directly referred to the act of teaching as an effort to improve their TPACK. As a sub-theme for "teaching practice", "lesson planning" emerged within the coded extracts. The lesson planning sub-theme

involved pre-service teachers' efforts on planning their lessons prior to teaching practice or based on their teaching practice. The instances on "teaching practice" mostly involved statements on classroom practice, teaching experience, and practicum as efforts on their own for improvement. On the other hand, extracts related to the "lesson planning" sub-theme consisted of statements in relation to the planning phase of teaching.

Sample Extract 1 on teaching practice:

I think, uh, actively being a teacher, but not being in the role of the teacher but some kind of helping teacher uh activates, develops my TPACK a lot. (Hacettepe University Group Interview, Student A)

Sample Extract 2 on teaching practice (sub-theme: lesson planning):

While preparing my lesson plan, I also use ChatGPT to get some creative ideas or some, let's say interesting, interesting or interactive activities for my students. I get some ideas and then I try to use (them). I try to improve the, let's say shape of the lesson or shape of the activity. So I have benefited from the ChatGPT a lot while the preparing uhh let's say process. (Bartın University Group Interview, Student B)

As a fourth theme, "usage of AI and online sources" emerged within the coded extracts. The extracts within this theme were related to pre-service teachers' statements on searching online for materials or content, self-improvement, and experimenting with AI on material design. The difference between the "usage of AI and online sources" theme and the "endeavor to improve technology integration" theme was that the "endeavor to improve technology integration" theme was directly related to the in-class efforts of pre-service teachers on integrating technology into teaching whereas the "usage of AI and online sources" theme was comprised of material design and self-improvement efforts outside the classroom. These extracts were not considered for the sub-theme of the prior theme ("lesson planning" sub-theme of the "teaching practice" theme) as the efforts of pre-service teachers within the "usage of AI and online sources" was not bound to the teaching practice of pre-service teachers and these instances were rather related to their efforts on improving their material design independent from their teaching practices.

Sample Extract 1 on usage of AI and online sources:

I'm just especially AI, I'm just so familiarized with it, so I try to, I Google, I search about it. I read about it because there are endless sources about this now about how to use artificial intelligence in teaching. So I think I read and my favorite is experimenting like I ask AI to do stuff. I try to create my own material. (Hacettepe University Group Interview, Student B)

Sample Extract 2 on usage of AI and online sources:

So I try to develop, improve my skills using some uhh you know websites there are, there are many websites already planned already uh made their uh worksheets kind of things. Worksheets, play- games. Uh, there are many websites to get, get, get help from them. (Kocaeli University Group Interview 2, Student A)

The fifth and final theme that emerged from the coded extracts on pre-service teachers' efforts to improve their TPACK was "academic endeavor". The coded extracts within this theme consisted of pre-service teachers' statements about academic research or study and attendance at academic events such as seminars. While this was the least frequent theme within the efforts to improve TPACK, some pre-service teachers expressed benefiting from such endeavors for TPACK development.

Sample Extract 1 on academic endeavor:

I also read some papers about classroom management and lesson planning and, throughout my internship, I believe, and I hope that I improved in this aspect. (Sakarya University Group Interview, Student B)

Sample Extract 2 on academic endeavor:

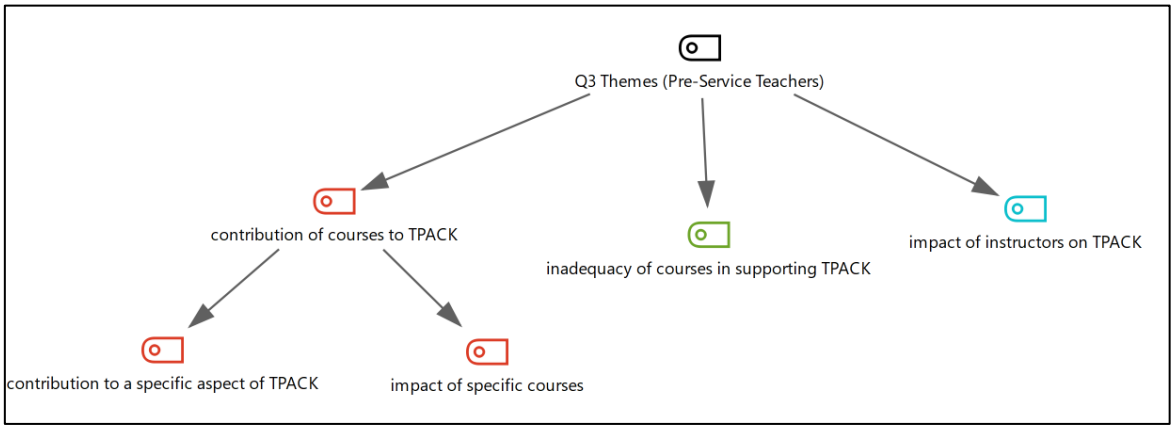
Also try to try to attend seminars, webinars or any form of uhh congress about. Uh- … So I try to attend seminars, congress in ELT in Turkey, about ELT in Turkey. (Sakarya University Group Interview, Student A)

Pre-service teachers' views on the effect of faculty courses and other resources on their TPACK

In order to uncover pre-service teachers' views on the effect of faculty courses and other resources on their TPACK, the question formulated in the semi-structured interviews was "How do you assess the effect of your faculty courses on your TPACK? How do the courses you take at your faculty contribute to your TPACK? Apart from the courses, is there any other resource that your faculty provide to support your TPACK?". Three main themes appeared as a result of the analysis of the coded extracts which were determined after the analysis of the responses of pre-service teachers. These themes were named as (1) contribution of courses to TPACK, (2) inadequacy of courses in supporting TPACK, and (3) impact of instructors on TPACK. For the first theme (contribution of courses to TPACK), the analysis revealed two sub-themes as well, which were named as (1) contribution to a specific aspect of TPACK and (2) impact of specific courses (Figure 10).

Figure 10

Themes for the Third Interview Question on Pre-Service Teachers' Interview Form



The most prevalent theme that emerged from the analysis of pre-service teachers on their views regarding the effect of faculty courses and other resources on their TPACK was "contribution of courses to TPACK". This theme involved coded extracts where pre-service teachers stated that their courses at their faculty did contribute to their TPACK in some way. The statements of pre-service teachers in which they referred to the contribution of courses to their TPACK in general was directly placed under the theme heading. Meanwhile, two sub-themes emerged on the impact of faculty courses. The first sub-theme

involved coded extracts in which pre-service teachers emphasized courses' positively affecting a specific aspect of their TPACK such as their technological knowledge or their pedagogical knowledge. This sub-theme was named as "contribution to a specific aspect of TPACK". The second sub-theme involved coded extracts of pre-service teachers' statements in relation to courses that contributed to their TPACK. In these extracts, pre-service teachers identified several specific courses that they indicated contributed to their TPACK. This sub-theme was named as "impact of specific courses". Together with the other sub-theme and the extracts related to the main theme, these extracts formed the most common theme in the analysis.

Sample Extract 1 on contribution of courses to TPACK:

I think that our courses at faculty really help us. (19 Mayıs University Group Interview, Student A)

Sample Extract 2 on contribution of courses to TPACK (sub-theme: contribution to a specific aspect of TPACK):

I think we can say that in a pedagogical level we have lots of, like, ELT classes that help us to teach the approaches like how to approach to, the, like the children and everything. On the content (base), I think we learn, we have this class, how to teach vocabulary, how to teach grammar and everything. It was a very intense course. It took like 3 hours every week and we talked about how to teach better, which approach is suited for which level. (Hacettepe University Group Interview, Student C)

Sample Extract 3 on contribution of courses to TPACK (sub-theme: impact of specific courses):

And then, of course, in the second grade and 3rd grade, we have methodology lessons, classes, like classes like teaching English to young learners, for example, öğretim teknolojileri (educational technologies) helps us improve our skills in technological knowledge, or classes like or lessons like teaching English to young learners especially helps us improve our skills in pedagogical knowledge and methodology lessons I think help us improve our content knowledge. (19 Mayıs University Group Interview, Student C)

The second theme that emerged from the analysis was “inadequacy of courses in supporting TPACK”, which involved coded extracts of pre-service teachers’ statements on their faculty courses’ insufficiency in effectively supporting their TPACK. In most of the extracts that formed this theme, pre-service teachers referred to their faculty courses as not effectively contributing to an aspect of their TPACK or not contributing much to their TPACK in general.

Sample Extract 1 on inadequacy of courses in supporting TPACK:

I think uh pedagogy and content part. Uh parts are OK, but (the) technology part is very lacking. (Hacettepe University Group Interview, Student A)

Sample Extract 1 on inadequacy of courses in supporting TPACK:

I think we can say that there are some classes that help us improve our TPACK skills or competency. But I'm not sure they are effective as much as they should be. (19 Mayıs University Group Interview, Student C)

The final theme that emerged from the analysis of the coded extracts on pre-service teachers’ views regarding the effect of their faculty courses and other resources was named as “impact of instructors”. Even though this theme was less prevalent within the extracts, the analysis indicated that some pre-service teachers perceived their instructors as having a positive effect on their TPACK directly or as making an effort to contribute to their TPACK.

Sample Extract 1 on impact of instructors:

We just experiment and get feedback. Like from my teachers, if it's good or not. So that's how we decide. As she said, we only have one teacher that taught us about how to use AI. (Hacettepe University Group Interview, Student B)

Sample Extract 2 on impact of instructors:

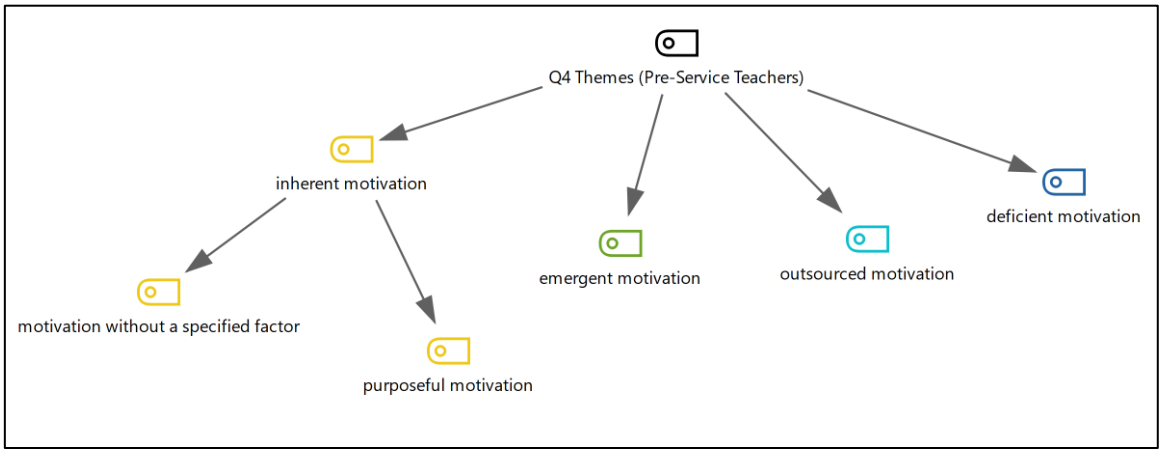
She (the instructor of the Materials Design course) shows us many technological advances and many, many websites that we can use in our classes… the pedagogical (base) and the TPACK as a whole is, is a main aspect of that material design class. (Sakarya University Group Interview, Student A)

Pre-service teachers' views on their motivation to teach

To reveal pre-service teachers' views on their level of motivation to teach, the question formulated for the semi-structured interviews was "How do you assess your motivation to teach? How motivated are you to teach?". The analysis of the coded extracts determined from the responses pre-service teachers provided for this question resulted in four themes. These themes were named as (1) inherent motivation, (2) emergent motivation, (3) outsourced motivation, and (4) deficient motivation. The analysis also revealed two sub-themes for the inherent motivation theme as well. These sub-themes were named as (1) motivation without a specified factor and (2) purposeful motivation (Figure 11).

Figure 11

Themes for the Fourth Interview Question on Pre-Service Teachers' Interview Form



Among the themes determined based on the coded extracts, "inherent motivation" was the most common one. The instances within this theme involved statements where pre-service teachers referred to their motivation as existing inherently. The first sub-theme, "motivation without a specified factor", consisted of coded extracts where pre-service teachers directly mentioned having motivation or high motivation. In some cases, pre-service teachers also indicated that this motivation existed even before they started their teacher education at their faculty or emerged earlier during their lives. In the case of the second sub-theme, "purposeful motivation", pre-service teachers mentioned either a

purpose that involved an emotional basis or an emotional commitment that provided them with motivation to teach and motivation to pursue a career in teaching.

Sample Extract 1 on inherent motivation (sub-theme 1: high inner motivation):

So, uh, I have a very good, very, uhh qualified motivation to teach and when we speak about assessment, if I feel happy while teaching it, I am motivated to teach. (Kocaeli University Group Interview 2, Student A)

Sample Extract 2 on inherent motivation (sub-theme 2: purposeful motivation):

I just realized that the first initial motivation for me to become a teacher was to help the students in the eastern part of Turkey because when I was in high school and even before that, I was thinking to myself when I was telling to my aunt and other people that, OK, I have like opportunities to learn English, learn German on- or learn any other language in in the West. Because I live in Tekirdağ, and it's all, it's all fine. It's all good. But in in the East, like Diyarbakır, Şırnak, in those places, they don't have access to Internet, or they don't have access to quality teachers, qualified teachers to teach them English, so that, that thinking, that thought, that thought actually started my motivation to become a teacher as well. (Sakarya University Group Interview, Student A)

The second most prevalent theme that appeared during the analysis of the coded extracts was “emergent motivation”. “Emergent motivation” involved coded extracts in which pre-service teachers indicated that their motivation had developed over time or through the processes associated with their teacher education. In the majority of instances, the pre-service teachers conveyed that their practicum experience, the teaching practice course, was instrumental in catalyzing and enhancing their motivation to teach.

Sample Extract 1 on emergent motivation:

Until the 3rd grade I didn't have a really big motivation to become a teacher, but after starting to, uhh did internship at private school, I realized that being the teacher is the best thing because you can help someone to change in a better way to just, to just give him a chance to show his abilities to just maybe change the world. (19 Mayıs University Group Interview, Student A)

Sample Extract 2 on emergent motivation:

Actually, last year, I thought that I hate being a teacher. I mean because, due to uhh. This year uhh we go to practicum and I saw the bright in students' eyes, that's why. That's why I said, yeah, I got to be a teacher. (Bartın University Group Interview, Student A)

The third theme that was identified during the analysis of the coded extracts was named as "outsourced motivation". This theme was characterized by pre-service teachers attributing their motivation to external influences. It was illustrated through statements where pre-service teachers explicitly indicated that their motivation to teach derived from external sources, such as their educators, or the interest and engagement of their students.

Sample Extract 1 on outsourced motivation:

I love teaching something to somebody. And that is why I can say that I'm quite motivated because especially thanks to my high school teacher, my high school English teacher, I get I get into English and that is why I am quite lucky to have such a teacher and that is why she affected me a lot and thanks to her I was so motivated to teach. (Bartın University Group Interview, Student B)

Sample Extract 2 on outsourced motivation:

Like, when I see them enjoying the classes and when I see them learning. It increases my motivation level. (Kocaeli University Group Interview 2, Student C)

The least common theme to emerge from the analysis of the coded extract of pre-service teachers' responses on their motivation to teach was tagged as "deficient motivation". The extracts placed within this theme involved statements of pre-service teachers where they expressed deficiency in their motivation or absence of motivation altogether. Some of the pre-service teachers attributed their lack or absence of motivation to a source while others did not specify a reason for the deficiency in their motivation.

Sample Extract 1 on deficient motivation:

Uhh. I am not motivated at all to teach and I'm not planning on, to, do it so, that's it. (Kocaeli University Group Interview 1, Student B)

Sample Extract 2 on deficient motivation:

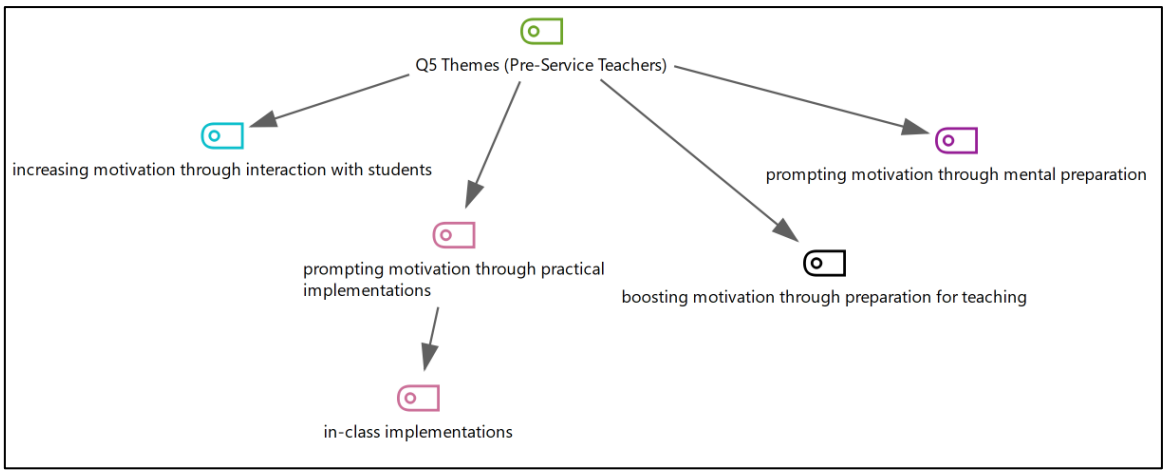
I want to be a teacher in the future. But I'm not motivated anymore. (19 Mayıs University Group Interview, Student B)

Pre-service teachers' efforts to improve their motivation to teach

In order to uncover pre-service EFL teachers' efforts to improve their motivation to teach, the question asked during the semi-structured interviews was formulated as "How do you define your effort to improve your motivation to teach? Is there anything you do to increase your motivation to teach?". The coded extracts from the analysis of pre-service teachers' responses to this interview question resulted in four distinct themes for the efforts they made to improve their motivation to teach. From the most commonly observed to the least prevalent one, the themes determined for the efforts of pre-service teachers were tagged as (1) increasing motivation through interaction with students, (2) prompting motivation through practical implementations, (3) boosting motivation through preparation for teaching, and (4) prompting motivation through mental preparation (Figure 12).

Figure 12

Themes for the Fifth Interview Question on Pre-Service Teachers' Interview Form



"Increasing motivation through interaction with students" was the most commonly observed theme within the coded extracts of the responses given. The pre-service teachers' statements placed under this theme involved the students serving as a catalyst for the improvement of their motivation to teach. The pre-service teachers' statements on their efforts to improve motivation through interaction with students referred to factors such as

feedback from students and student engagement in the classroom. Interaction with their students was mostly referred to as a source that contributed to their motivation rather than a direct effort to improve motivation. However, as it was a factor that was repeatedly articulated as a factor that increased their motivation when asked about their efforts, interaction with students was placed within pre-service teachers' efforts to improve their motivation.

Sample Extract 1 on increasing motivation through interaction with students:

My activities are getting their attention and when they get attention, I also pay much more attention to my lesson, I enjoy my lesson, I enjoy with my students and that's the case I believe, uhh thanks to help of- I mean thanks to your activities and uhh your motivation will be increased and then everything will be better I believe. (Bartın University Group Interview, Student B)

Sample Extract 2 on increasing motivation through interaction with students:

We go to some government schools for internship, as you know, and to improve my motivation. I try to, I tried to, uh, interact with the students there. I try to, uh teach them some little tips about the language, and I try to get some feedback from them and when I take some good feedbacks from them, this actually kinda increase(s) my motivation. (19 Mayıs University Group Interview, Student C)

The second most common theme that emerged from the analysis of the coded extracts was "prompting motivation through practical implementations". This theme involved extracts in which practices such as peer collaboration between pre-service teachers, reflective practice, self-care, and professional development were mentioned by pre-service teachers. The analysis also revealed that a part of the practices put forth by pre-service teachers were directly related to practices they engaged in in the classroom, which were placed under a sub-theme named as "in-class implementations".

Sample Extract 1 on prompting motivation through practical implementations:

I was reading a lot of articles about how to teach effectively to children who have hyperactivity cause it's really hard. So this is the way I, I, like, increase my- it, it, it helps me

to be, to stay motivated to teach because being (a) teacher is really hard. (19 Mayıs University Group Interview, Student A)

Sample Extract 2 on prompting motivation through practical implementations (sub-theme: in-class implementations):

Uhh when I feel, like, down and when I feel unmotivated, I always try to change my style with, uhh by that, by changing my style, I actually find another challenge. And with that challenge, I motivate my- I motivate myself to overcome that obstacle over that, overcome that struggle and challenge, then it motivates me a lot. (Sakarya University Group Interview, Student A)

The third common theme that emerged from the analysis of the coded extracts was named as “boosting motivation through preparation for teaching”. The efforts of pre-service teachers that related to this theme involved practices such as lesson planning and content search. The theme also involved pre-service teachers’ efforts on material design.

Sample Extract 1 on boosting motivation through preparation for teaching:

If I am all set, if I, if I know what to teach, which material I'm going to use, like if I'm all set to teach, that really motivates me because the only thing that I, that I have to worry about is just going to class and just talk. And that's why I bring some stuff so we can share, we can talk about it and that's why I like, that's, that's one of the things that I do to increase my motivation to teach. (Hacettepe University Group Interview, Student C)

Sample Extract 2 on boosting motivation through preparation for teaching:

Uh to improve my motivation I would, uh think about the lesson beforehand. When I make a lesson plan, for example, and, I would think about what the, uh, some particular students would react to some topics. For example, if we're making a discussion one of, or two of my students would probably say this, and they would mention, for example, football or one of my students is obsessed with ice skating. So I would talk, think about the reactions and I would try to think, wow would how lesson would go, uh, how would they uh, make the lesson uh, go someplace, for example, when we're talking about invitation, the lesson, go to some fancy dress uh parties or it can go to like uh or uh, depressing sides as well for

some classes because they're they're not just wanting to, that they're not that energetic, I think, what motivates me is I would think about it and I would try to guess what will happen in the lesson and that just motivates me, I think. (Hacettepe University Group Interview, Student A)

The fourth and final theme that emerged from the analysis of the coded extracts was "prompting motivation through mental preparation". The extracts in which pre-service teachers' efforts on mentally preparing themselves for teaching or mentally prompting excitement for teaching when their motivation diminished were included within this theme.

Sample Extract 1 on prompting motivation through mental preparation:

It is me in, at the end of the day. So I try to talk (to) myself. I try to say (to) myself like I need to do better. Like I need to improve my teaching skills and for me and for the, for my students, because like they, I think they need some quality teaching in their lives. So that they can. Uh, have some uhh enthusiasm in the future for their uh learning time. Yeah, that's all. I guess it's just speaking to myself. (Kocaeli University Group Interview 2, Student B)

Sample Extract 2 on prompting motivation through mental preparation:

Uh, I usually uh try to motivate, motivate myself, uh about the graduation because I want to graduate. (Sakarya University Group Interview, Student C)

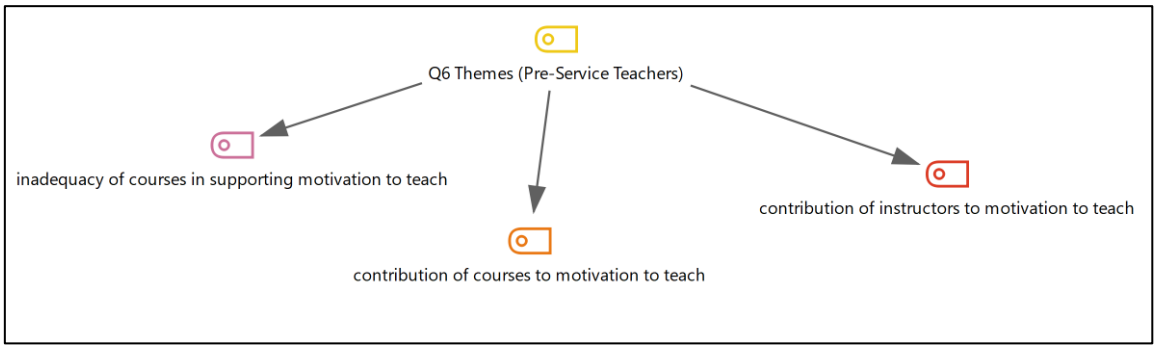
The examination of the coded extracts of the responses given to this interview question demonstrated that one pre-service teacher had difficulty in showing effort to improve motivation due to a variety of external and internal factors such as the procedure to become a teacher and their own psychological state. On the other hand, another pre-service teacher remarked explicitly that they did not show any effort or commitment towards the improvement of their motivation level in any capacity.

Pre-service teachers' views on the effect of faculty courses and other resources on their motivation to teach

To reveal pre-service EFL teachers' perceptions on the effect of their faculty courses and other resources provided for them at their faculty on their motivation, the question asked during the semi-structured interviews was formulated as "How do you assess the effect of your faculty courses on your motivation to teach? How do the courses you take at your faculty contribute to your motivation to teach? Apart from the course, is there any other resource that your faculty provide to support your motivation to teach?". Three themes were uncovered through the analysis of the coded extracts of pre-service teachers' responses. These themes were named as (1) inadequacy of courses in supporting motivation to teach, (2) contribution of courses to motivation to teach, and (3) contribution of instructors to motivation to teach from the most commonly observed to the least common one (Figure 13).

Figure 13

Themes for the Sixth Interview Question on Pre-Service Teachers' Interview Form



The most commonly observed theme that emerged from the analysis of the coded extracts was named as "inadequacy of courses in supporting motivation to teach". The coded extracts from the responses of the pre-service teachers which were placed under this theme included statements where pre-service teachers referred to courses in most cases as not sufficiently contributing to motivation to teach, while two pre-service teachers stated that courses diminish motivation.

Sample Extract 1 on inadequacy of courses in supporting motivation to teach:

As my friend said so, we don't have many, you know, effective courses to motivate (us) to teach. (Kocaeli University Group Interview 2, Student A)

Sample Extract 2 on inadequacy of courses in supporting motivation to teach:

The micro teachings we have, which is as you know, our friends, are others, teachers act like they're the student. And it's just it kind of diminishes my motivation about it. Because, uh, they are usually not very eager to participate. And you just feel weird and you have to act it out instead of, uh, having a real teaching session. (Hacettepe University Group Interview, Student B)

The second theme that the analysis uncovered was named as “contribution of courses to motivation to teach”. Just as the first theme involved coded extracts on the inadequacy of the courses in supporting motivation, the coded extracts placed under the second theme involved pre-service teachers’ statements on the impact of their faculty courses in supporting motivation to teach. The frequency of the coded extracts for these two themes were also quite close to each other. While the majority of the coded extracts place under the first theme referred to the faculty courses collectively, most coded extracts of pre-service teachers within the “contribution of courses to motivation to teach” theme involved statements on the impact of individual courses such as teaching English to young learners and teaching language skills.

Sample Extract 1 on contribution of courses to motivation to teach:

Especially our lesson, teaching English to young learners were so fun and we really had fun there. We enjoyed the lesson and, whenever we do something about the lesson, it actually helped us increase our motivation to teach, because in that lesson we were both teachers and students at the same time. (19 Mayıs University Group Interview, Student C)

Sample Extract 2 on contribution of courses to motivation to teach:

Some courses offer opportunities to collaborate with peers and experts, expanding my professional network. These connections can lead to collaborative projects and discussions that umm rejuvenate my interest and commitment to teaching. (Kocaeli University Group Interview 1, Student C)

The third and last theme that the analysis uncovered was named as “contribution of instructors to motivation to teach”. The coded extracts of pre-service teachers’ statements

reflected their perceptions on their instructors at their faculty as a supporting factor for the improvement of their motivation to teach. Some pre-service teachers also stated that instructors who taught courses rather than courses themselves contributed to their motivation to teach.

Sample Extract 1 on contribution of instructors to motivation to teach:

Instructors, uh, have a great impact on uh, our motivation. Uh especially. The uh instructors are, are, approaches and literature teachers, uh, instructors have been very effective for our uh motivate- motivation. (19 Mayıs University Group Interview, Student B)

Sample Extract 2 on contribution of instructors to motivation to teach:

But I can say that our faculty, uh, really motivate us. Actually, not the faculty. It's the teacher. Yes, our teachers are, I think our teachers are good and they help us to motivate ourselves. It's the teacher. (Kocaeli University Group Interview 2, Student B)

Apart from the coded extracts organized into themes here, two independent cases were observed within the data. One pre-service teacher expressed that the speaking club they had in their department provided support for their motivation to teach through providing opportunities to guide other people. Another pre-service teacher also mentioned research opportunities that they had at their faculty helped improve their motivation to teach.

Research Question 5: What are the views of the academics in EFL departments about their students' TPACK and their motivation to teach?

For the purpose of revealing the views of academics in EFL departments in relation to their students' TPACK and their motivation to teach six questions were adopted in the semi-structured interviews conducted which were as follows:

1. How do you assess your students' technological pedagogical content knowledge (TPACK) competency level?
2. In which areas of their TPACK do you think they have strength? In which areas do you think they need to develop their TPACK?

3. What kind of curricular materials and courses do you provide for your students to improve their TPACK levels? Within the curriculum, is there anything else you do or implement to support their TPACK?

4. What kind of extra-curricular materials, resources, and workshops do you provide for your students to improve their TPACK levels? Apart from the curriculum, is there anything else you do or implement to support their TPACK?

5. How do you assess your students' motivation to teach? In your opinion, how motivated are they to teach? Can you elaborate?

6. How do you define the relationship between your students' TPACK and their motivation to teach? Do you think there is a relationship between their TPACK and their motivation to teach? If so, how do they relate to each other?

Like in the case of the pre-service teachers' interview questions, the final question on the semi-structured interview form for the academics was analyzed for the first research question. The prior five questions were analyzed for academics' views on their students' TPACK and motivation to teach. As in the pre-service teachers' interview questions, the thematic analysis process was carried out for each question separately. The frequencies of the themes were analyzed after the themes for each question were determined to order the themes based on how common the themes were. The findings from the thematic analysis for each question is presented in this section in the same order they were discussed during the interviews.

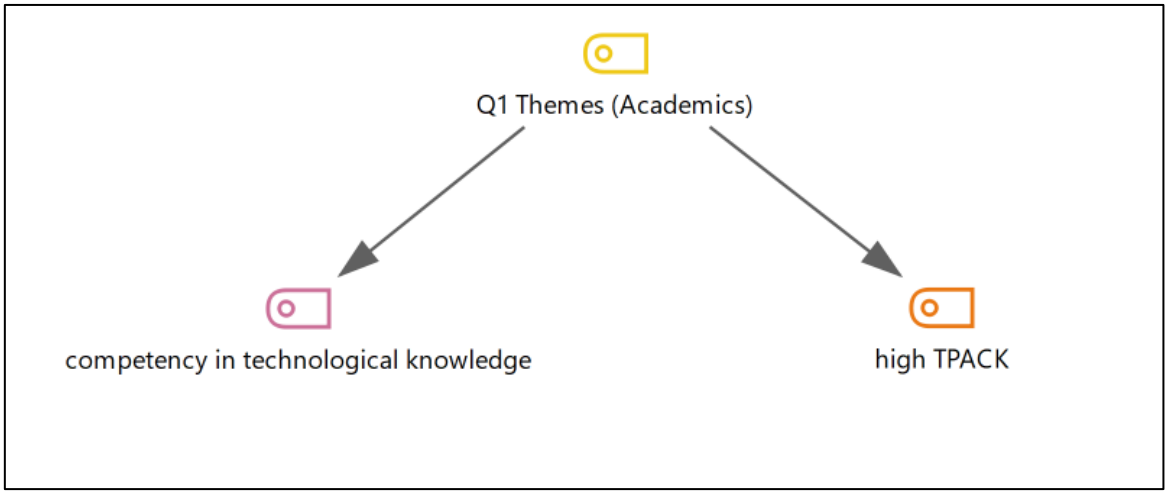
Academics' views on their students' TPACK competency

For the purpose of uncovering academics' views on their students' TPACK competency, the question formulated for the semi-structured interview was "How do you assess your students' technological pedagogical content knowledge (TPACK) competency level?". The analysis of the coded extracts of academics' responses revealed two themes regarding academics' perceptions of their students' TPACK competency levels. These were named as (1) competency in technological knowledge and (2) high TPACK (Figure 14).

Apart from the themes that emerged, one academic also highlighted that their students lacked pedagogical knowledge.

Figure 14

Themes for the First Interview Question on Academics' Interview Form



"Competency in technological knowledge" was the more prevalent one of the two themes. This theme involved cases where academics referred to high technological knowledge of their students. They also articulated their students' competence in integrating technology into teaching and their ability in using technological devices.

Sample Extract 1 on competency in technological knowledge:

So they're more, more open to, you know, integrating technology because they also themselves like the idea, and they're used to it because of this developing student profile. (Hacettepe University Academic Interview)

Sample Extract 2 on competency in technological knowledge:

It. It's at least what I observe during the things that they, they are doing when we go to school practice or when they are doing micro-teaching in classes and when they are making presentations, if it is a theoretical course. So they can easily adapt technological tools to the teaching of the, regardless of the content, it can be either some specific methodologies. It can be related to, let's say, some content like literature and some other things, so they are quite good at using them. (Kocaeli University Academic Interview 1)

The second theme that emerged from the analysis of the coded extracts was named as “high TPACK”. The instances related to this theme were less frequent compared to the first theme. However, some academics referred to their students’ TPACK competency as high. Only four statements were observed within the coded extracts in which academics referred to the high competency level of TPACK in pre-service teachers.

Sample Extract 1 on high TPACK:

In that regard, the(ir) pedagogical, technological, pedagogical content knowledge, but based on the courses that I have given and the assignments that they completed for my courses, I would say that their competency level is considerably high. (Bartın University Academic Interview 2)

Sample Extract 1 on high TPACK:

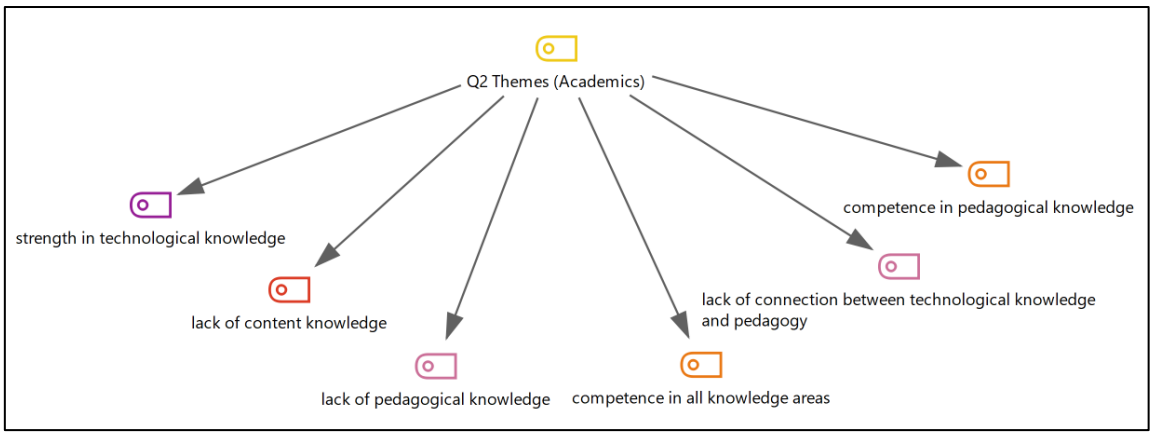
I will say very high Hocam… So I can say it is very high when they come to the 4th grade. (Sakarya University Academic Interview)

Academics’ views on their students’ strengths and weaknesses regarding TPACK

To reveal academics’ perceptions on their students’ strengths and weaknesses regarding their TPACK, the semi-structured question asked during interviews was formulated as “In which areas of their TPACK do you think they have strength? In which areas do you think they need to develop their TPACK?”. The analysis of the coded extracts revealed six themes; however, the final three themes only had two instances each. As the most common theme involved six coded extracts, the cases with two instances were considered as themes within the data. Apart from the themes, there was one instance where an academic mentioned that half of their students were quite competent in content knowledge. The themes determined based on the coded extracts were named as (1) strength in technological knowledge, (2) lack of content knowledge, (3) lack of pedagogical knowledge, (4) competence in all knowledge areas, (5) lack of connection between technological knowledge and pedagogy, and (6) competence in pedagogical knowledge (Figure 15).

Figure 15

Themes for the Second Interview Question on Academics' Interview Form



Just as "competency in technological knowledge" was the most prevalent theme regarding academics' views on their students' TPACK, "strength in technological knowledge" emerged as the most common theme within the coded extracts of academics' responses. This theme involved cases where academics directly mentioned their strength in adopting technology or using technology.

Sample Extract 1 on strength in technological knowledge:

So. Maybe. The area in which they have the high strength might be technology, technology on its own, without integrating it with the other components. (Kocaeli University Academic Interview 1)

Sample Extract 2 on strength in technological knowledge:

But technological knowledge is their strongest area as far as I observe. (Pamukkale University Academic Interview)

The second commonly observed theme within the coded extracts was named as "lack of content knowledge". The instances in these extracts involved academics' statements where they referred to the low or insufficient competency of their students in terms of content knowledge or where they demonstrated their skepticism about the competence of their students.

Sample Extract 1 on lack of content knowledge:

I am not sure if their content knowledge would be considered good enough. (Bartın University Academic Interview 2)

Sample Extract 2 on lack of content knowledge:

You know, in terms of content knowledge, they are doing fine, but they don't pay attention to correct pronunciation. They easily, you know, feel distracted. Some, you know, this is what I observe. So content knowledge also can be sometimes problematic, let's say. (Pamukkale University Academic Interview)

The third theme emerging from the analysis of the coded extracts of academics regarding their students' strengths and weaknesses in TPACK was named as "lack of pedagogical knowledge". The instances related to this theme involved cases where academics expressed that their students' pedagogical knowledge was not the level they desired.

Sample Extract 1 on lack of pedagogical knowledge:

But they need to improve in pedagogy because pedagogy cannot be taught with books only. Pedagogy is taught with experience, is learned by experience, is taught by other teachers, is learned by the teacher who is to practice teaching in their future career. (Atatürk University Academic Interview)

Sample Extract 2 on lack of pedagogical knowledge:

Maybe for the pedagogical part, they may need some more instruction or some more training. (Ondokuz Mayıs University Academic Interview)

The remaining three themes only had two cases each and thus were reported here together. The cases on "competence in all knowledge areas" involved statements of academics in which they stated that their students were competent in all knowledge bases whereas the cases in relation to "lack of connection between technological knowledge and pedagogy" included academics' remarks on the disconnection between the high technological knowledge competency of their students and their pedagogical knowledge or practices. The final theme that appeared as a result of the analysis, "competence in

pedagogical knowledge", involved academics' statements on their students' proficiency regarding their pedagogical knowledge.

Sample Extract on competence in all knowledge areas:

They have strengths in all of them. I would say they have strengths in all of them. (Sakarya University Academic Interview)

Sample Extract on lack of connection between technological knowledge and pedagogy:

The kind of areas they need to develop is the connection of technology to pedagogical content knowledge. At which point, for which, what purposes they, they have to integrate technology, this is what they need to know. I mean in daily life or you know, with access to all these, you know, Internet, social media, technological tools, applications and everything. They, they may be aware of these things, but when it comes to practice, they may not not know how to integrate them, which requires training. (Hacettepe University Academic Interview)

Sample Extract on competence in pedagogical knowledge:

Their pedagogical knowledge was quite good actually, because when I asked them to write reports based on the teachers' teaching practices, their reports showed me that they can analyze actually how a teacher gives a class based on their pedagogical knowledge, they can, they could interpret really well. So when I was given that class, actually, I was really happy because I was getting satisfied by their answers, how they interpreted the videos that I gave them. (Bartın University Academic Interview 1)

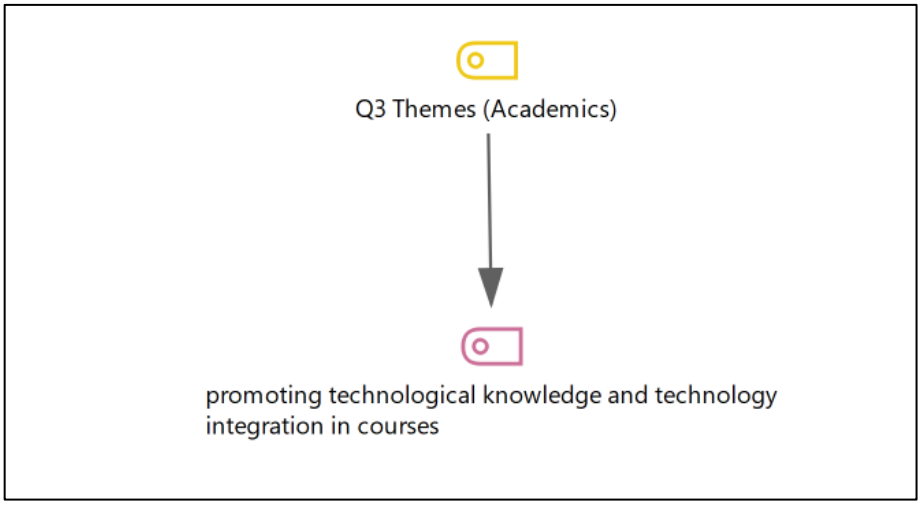
Academics' responses on curricular resources provided to pre-service teachers for TPACK improvement

For the purpose of revealing academics' views on the curricular resources provided to pre-service teachers to support their TPACK, the question asked during the semi-structured interviews with academics was formulated as "What kind of curricular materials and courses do you provide for your students to improve their TPACK levels? Within the

curriculum, is there anything else you do or implement to support their TPACK?". The analysis of academics' responses to this question revealed only one theme (Figure 16), which was named as "promoting technological knowledge and technology integration in courses". This was a theme that was quite prevalent within the coded extracts.

Figure 16

Themes for the Third Interview Question on Academics' Interview Form



The majority of the instances within this theme involved statements of academics regarding specific courses in their curricula that supported technological knowledge or had the aim of developing the technology integration of pre-service teachers into their own teaching. Among the courses that academics mentioned during interviews were courses such as IT/ICT, CALL, material design, and teaching English to young learners.

Sample Extract 1 on promoting technological knowledge and technology integration in courses:

In different classes, not just on, in the classes on technology and computer and skills, something like that, but also in field based classes as well, we are promoting the use of digital materials. (Sakarya University Academic Interview)

Sample Extract 2 on promoting technological knowledge and technology integration in courses:

But we have some courses. Uh, like ICT, I, I can't remember the exact title of the course right now, but there is that course in which the, our instructors in the department

teach our students how to make use of those tools in their teaching practices. (19 Mayıs University Academic Interview)

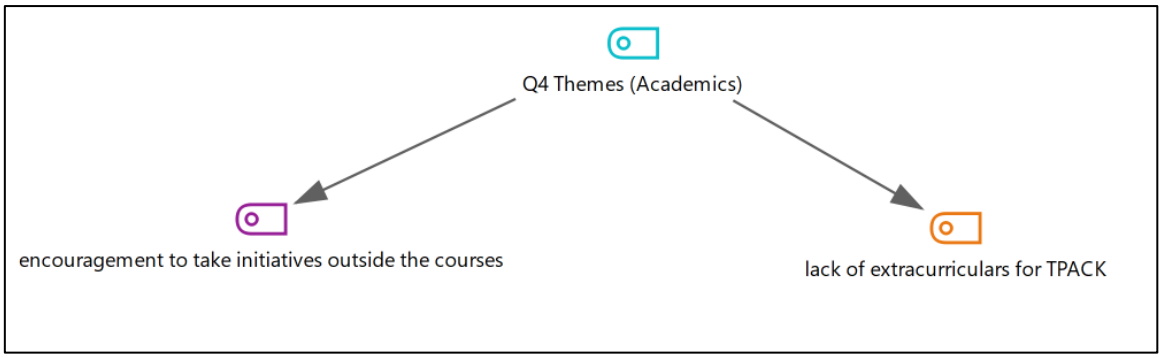
Apart from this theme that dominated the majority of the coded extracts, three separate cases appeared within the interview data that reflected academics' views. In one case, one academic stated that the discourse analysis course offered at their faculty supported the pedagogical knowledge of pre-service teachers whereas another academic expressed that all English as a medium of instruction (EMI) courses contributed to the content knowledge of pre-service teachers due to the nature of the department itself. Conversely, one academic highlighted that there were not enough curricular opportunities to support pre-service teachers' TPACK as the curriculum did not have enough flexibility to specifically provide support for TPACK development.

Academics' responses on extracurricular resources provided to pre-service teachers for TPACK improvement

Similar to the previous interview question on curricular resources, the question to reveal academics' views on the extra-curricular resources provided to pre-service teachers to support their TPACK was formulated as "What kind of extra-curricular materials, resources, and workshops do you provide for your students to improve their TPACK levels? Apart from the curriculum, is there anything else you do or implement to support their TPACK?". The analysis of academics' responses to this question revealed two themes with similar frequencies within the coded extracts. These themes were named as (1) encouragement to take initiatives outside the courses and (2) lack of extracurriculars for TPACK (Figure 17).

Figure 17

Themes for the Fourth Interview Question on Academics' Interview Form



The first theme that was named as “encouragement to take initiatives outside the courses” involved the coded extracts of academics in which they stated that pre-service teachers at their department were prompted to take part in different extracurricular activities to improve their TPACK such as following journals or attending webinars, seminars and other academic events.

Sample Extract 1 on encouragement to take initiatives outside the courses:

We've been working very well with the American Embassy in Ankara and they've been organizing such kind of online workshops and trainings a lot and we've been sharing, let's say such kind of online courses with our students as much as possible, and they are really interested in taking part in such kind of activities and they (the Embassy) are also providing some extra materials, some resources which, which will help them to improve their TPACK levels. (Kocaeli University Academic Interview 1)

Sample Extract 2 on encouragement to take initiatives outside the courses:

But sometimes I ask my students to follow certain journals, most, the, the most practical ones like English teaching forum, ELT journal, uh, so that they, they keep up with the recent developments like AI. (Hacettepe University Academic Interview)

The second theme that emerged from the analysis of the coded extracts of academics’ responses to this interview question was “lack of extracurriculars for TPACK”. In these extracts, academics highlighted either not having knowledge about the existence of any extracurricular activities for TPACK or the absence of activities to support TPACK. Only three coded extracts were determined to be placed in this theme.

Sample Extract on lack of extracurriculars for TPACK:

As far as I know, no. In the department, no, but sometimes from the university we get some trainings and we inform our students that you can attend those courses or the seminars or whatever. But within the department. No, we don't. If I'm not mistaken, we don't have anything extracurricular. (Ondokuz Mayıs University Academic Interview)

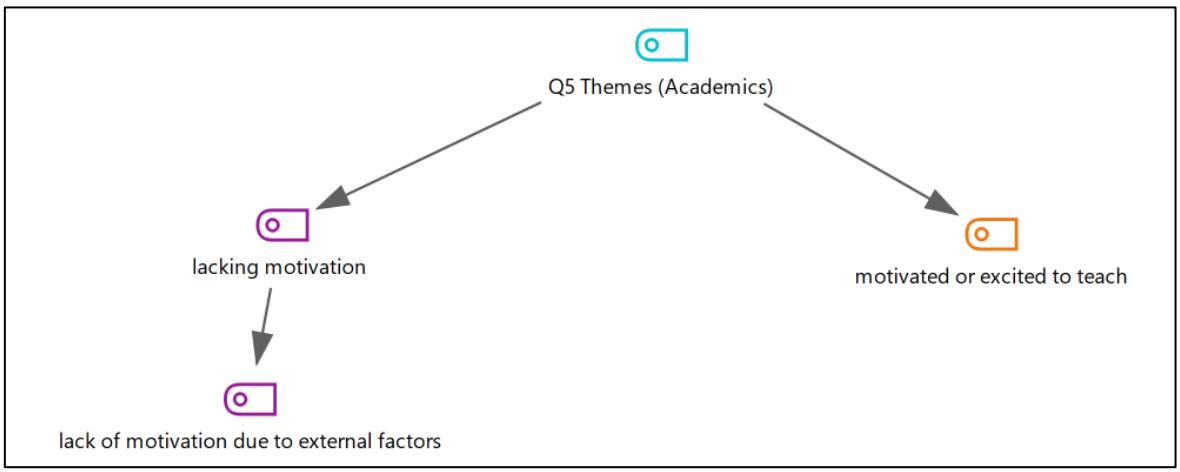
Apart from these two themes, there was one singular coded extract where one academic stated that TPACK development happened naturally as part of any extracurricular activity. She stated that their students' TPACK would increase when they participate in any kind of extracurricular activity within the department regardless of whether the activities had the aim of supporting their TPACK.

Academics' views on their students' motivation to teach

In order to uncover the views of academics on their students' motivation to teach, the question asked during the semi-structured interviews was formulated as "How do you assess your students' motivation to teach? In your opinion, how motivated are they to teach? Can you elaborate?". The responses of academics to this question revealed two themes, which were named as (1) lacking motivation and (2) motivated or excited to teach (Figure 18). The analysis also revealed a sub-theme for the first theme, which was "lack of motivation due to external factors".

Figure 18

Themes for the Fifth Interview Question on Academics' Interview Form



The first theme that emerged from the analysis of the coded extracts, “lacking motivation”, was quite prevalent compared to the second theme. The theme involved statements of academics where they highlighted either pre-service teachers’ having no motivation to pursue teaching or lacking in motivation to an extent. A portion of the extracts referred to pre-service teachers’ lack of motivation as being caused by an outside factor. These extracts formed a sub-theme named as “lack of motivation due to external factors”.

Sample Extract 1 on lacking motivation:

I hear most students who are unwilling to teach. They say I'm not going to be a teacher anyway. So why, why (would) I care about these courses? (Hacettepe University Academic Interview)

Sample Extract 2 on lacking motivation (sub-theme: lack of motivation due to external factors):

Because of some reasons, let's say, recently revealed, unfortunately what I observe is that they have lost their motivation, at least some of them. Because they don't know. Uh, whether uh, they will be able to, let's say, appointed to a specific school that they would like to work in. Whether they will start, they will be able to start working for the Ministry of National Education or not. (Kocaeli University Academic Interview 1)

While lacking motivation dominated the majority of the coded extracts, some academics also expressed their students’ motivation to teach. The extracts involving these statements were placed under the theme named as “motivated or excited to teach”. In these extracts, academics highlighted that their students were motivated or excited to teach.

Sample Extract 1 on motivated or excited to teach:

They are motivated. Honestly speaking, they are motivated. They have the excitement that they will be teachers next year, the following year or in, perhaps in the ministry, in the schools in the ministry or in (the) private sector. (Atatürk University Academic Interview)

Sample Extract 2 on motivated or excited to teach:

I could maybe talk for my students last semester because I had the opportunity to observe them at their practicum schools. And both during the lesson that they taught and in the feedback session that we had after their lessons, they, they seemed to have very positive attitudes towards being a teacher, they seem to enjoy teaching. (Bartın University Academic Interview 2)

Discussion of the Findings

This study aimed to reveal the relationship between the TPACK and teaching motivation of 4th-year pre-service EFL teachers in Turkish public universities. With this purpose, the study centered upon pre-service teachers' levels of teaching motivation and TPACK were explored. The views of pre-service teachers along with the academics that teach them were also investigated regarding the teaching motivation and TPACK of pre-service teachers. In this section, in order to explain the findings of the study, the results of the analysis for the main research question are discussed. Afterwards, the results of the sub-research questions are addressed. Based on this order, the discussion of the findings of the study is presented following the research question order and under five headings in this section:

1. The relationship between pre-service EFL teachers' TPACK and their motivation to teach
2. Pre-service EFL teachers' levels of motivation to teach
3. Pre-service EFL teachers' levels of TPACK
4. Perceptions of pre-service EFL teachers regarding their TPACK and their motivation to teach
5. Perceptions of the academics in the EFL departments regarding their students' TPACK and their motivation to teach

Discussion of the Findings of Research Question 1: The Relationship Between Pre-Service EFL Teachers' TPACK and Their Motivation to Teach

The relationship between pre-service EFL teachers' TPACK and their motivation to teach was explored through the analysis carried out for the main research question of this study. The EFL-TPACK Scale (Wang, 2022) and the Motivation to Teach Scale (Kauffman et al., 2011) were administered to 4th-year pre-service EFL teachers in public universities. The simple linear regression analysis was carried out to reveal the relationship between motivation to teach and TPACK. Two models were used for this analysis and the two variables were placed as the dependent variable in each model. The reason for building two separate models with each variable being the dependent variable for the two models was to reveal whether the relation between the two variables was predicted by the independent variable in each model.

The results of the Pearson Correlation coefficient presented a value (,402) that could be interpreted as a moderate positive correlation in both models (Field, 2013) and also presented a ,000 significance value that signaled the result was statistically meaningful. This indicated that there was a positive association between the TPACK and teaching motivation scale results of pre-service EFL teachers. However, it was inferred that, since the coefficient value was moderate, this positive relationship was not strong as to imply that the scale results for pre-service teachers' TPACK and teaching motivation was high. The regression analysis models also provided results supporting this inference. The regression coefficients for each model in the analysis provided ,000 significance values that indicated the models were meaningful statistically. Though there was a statistically significant result, the adjusted R square results showed that only 16% of the variance in the dependent variable could be explained by the independent variable in each model. This was assumed as an indication that the TPACK results and teaching motivation results of pre-service teachers in the related scales demonstrated minimal predictive power with respect to each

other, given that only a limited fraction of 16% of the variance could be accounted for by the other variable.

While only a limited portion of the variance in the dependent variable in the models was predicted by the independent variable, the regression coefficients provided contrasting results for the TPACK and teaching motivation of pre-service teachers in terms of the direction of relation between the predictive and dependent variables in each model. The significance values for the regression coefficients indicated that both TPACK and motivation to teach had a statistically meaningful impact over the other. However, the regression coefficients indicated that the impact each variable had over the other differed. The regression coefficient for the model where TPACK scale results was the predictor variable resulted in a ,196 regression coefficient value whereas the model where the results for motivation to teach was the predictor variable provided a regression coefficient value of ,823. The difference in the coefficient values in the models implied that the impact of motivation to teach over TPACK was statistically bigger than the impact of TPACK over motivation to teach.

Having taken into account the results of coefficient values and regression models, it is understood that the pre-service teachers' TPACK and motivation to teach were positively related to each other and that they each had an impact over the other. The impact of motivation to teach over TPACK was observed to be higher. This implied that the impact of an increase in the motivation to teach over an increase in TPACK is relatively higher compared to the impact of an increase in TPACK over an increase in motivation to teach. On the other hand, it is also inferred from the results that the relationship between motivation to teach and TPACK is moderate and that each has only a limited predictive power over the other.

The outcomes of the seventh question from the semi-structured interviews with the pre-service teachers and the sixth question from the semi-structured interviews with academics on the relationship between pre-service teachers' TPACK and their motivation to teach were analyzed through thematic analysis in order to juxtapose the quantitative and

qualitative data. The themes that emerged from the interviews conducted with pre-service teachers were observed to be in close alignment with the results of the regression analysis carried out for the data collected through scales. In a similar manner, the themes obtained from the analysis of the interviews with academics demonstrated some alignment with the regression analysis results.

The responses from the pre-service teachers revealed that the majority of them believed there was a relationship between their TPACK and their motivation to teach. This was the most prevalent theme in the responses of the pre-service teachers. The responses of the academics also indicated that they believed there is a high relation between their students' TPACK and motivation to teach. These results supported the findings of the regression analysis, which revealed there was in fact a relation between TPACK and motivation to teach. However, both the responses of pre-service teachers and academics attributed a higher or deeper relation between these two phenomena compared to the revelations of the regression analysis. The responses of pre-service teachers were also observed to be aligned with the regression coefficient results since the theme on the impact of motivation to teach over TPACK was more prevalent compared to the theme on impact of TPACK over motivation to teach. In the academics' responses, however, the impact of TPACK over motivation to teach was the second and last theme that emerged from the analysis. The reason for the fact that the academics' considered TPACK's impact to be higher over motivation to teach could be due to their beliefs on their students' strength in technological knowledge as well as in general technological pedagogical content knowledge while their remarks on their students' motivation to teach indicated that they believed their students lacked motivation.

The fact that the scale results of pre-service teachers and their responses to the interview question were in unison with each other implied that their understanding of the scale questions were consistent with their understanding of the interview question. Moreover, their views on the relationship of the impact of motivation to teach and TPACK were also observed to be in alignment with the findings of the scale results. Though the

academics were also understood to hold similar views on the existence of a relationship between the motivation to teach and TPACK, their views on the impact relation of the two variables is seen to be partially different in comparison to the views of pre-service teachers. Considering the themes that emerged from the responses of pre-service teachers and academics regarding the relationship between TPACK and motivation to teach, it is understood that both groups of participants believed motivation to teach and TPACK to have a positive relationship with each other.

Discussion of the Findings of Research Question 2: Pre-Service EFL Teachers' Levels of Motivation to Teach

The teaching motivation levels of pre-service EFL teachers were explored following several steps in this study. Their scores from the Motivation to Teach scale as well as the intrinsic and extrinsic sub-scales were analyzed. The score means and score percentages against totals scores were explored to determine pre-service teachers' level of motivation to teach. The results indicated that the mean score of pre-service teachers on the Motivation to Teach scale was close to 50 out of 72, with their intrinsic motivation and extrinsic motivation mean values being 29 out of 42 and around 21 out of 30, respectively. Though the mean values did not directly indicate the rate of each motivation result against each other, the percentages of the scores provided a clearer output. The scores of the Motivation to Teach Scale as a whole and the intrinsic and extrinsic motivation subscales all yielded results around the percentage of 69 against the total possible scores. The fact that the subscale results yielded similar results could be interpreted as an indicator that the intrinsic and extrinsic motivations of pre-service teachers were quite close to each other in terms of their ratio. From this outcome, it was inferred that the 4th-year pre-service EFL teachers were both intrinsically and extrinsically motivated in an equal manner. The result of the paired samples t test carried out on the mean scores of the subscales also supported this inference. The paired samples t test result indicated that the intrinsic motivation and extrinsic motivation of pre-service teachers were significantly correlated with a correlation

value of 0,715, meaning that they were positively related to each other. The significance value of the test suggested that the mean values of the intrinsic and extrinsic motivation results of pre-service teachers were not statistically different from each other. Thus, this result was also interpreted as an indicator that pre-service teachers' intrinsic and extrinsic motivations were equal to each other. This outcome of the study was in contrast with earlier studies that reported pre-service teachers to have significantly higher intrinsic motivation against their extrinsic motivation (Sinclair, 2008; Bruinsma & Jansen, 2010; Yütük, 2018; Zhang et al. 2020).

In terms of their general motivation levels according to geographical regions, it was seen that pre-service teachers' motivation did not vary based on their regions. Thus, it was concluded that the 4th-year pre-service EFL teachers in public universities at different geographical regions had similar motivation levels. The fact that pre-service teachers' score ratios were 69% percent for the general motivation levels and the intrinsic and extrinsic motivation levels indicated that their motivation levels were close to high in the scale results. Though their motivation levels were lower than expected for the Motivation to Teach Scale, their motivation level is evaluated to be high with the reinforcement of pre-service teachers' perceptions on their own motivation levels as they mostly described themselves as motivated to teach. The results on the motivation levels of pre-service teachers aligned with the findings of Başöz (2021) and Cengiz (2023) as well. Başöz (2021), in her study involving the exploration of the reasons for pre-service teachers to choose teaching for study and as a career, revealed that the pre-service EFL teachers in the study demonstrated moderately high levels of career motivations for teaching. In the same line, Cengiz (2023) indicated that pre-service EFL teachers in his study were highly motivated to become English language teachers. Similar to the findings of these studies, the current study also reported that pre-service teachers had moderately high levels of motivation to teach.

Pre-service teachers' motivation to teach may have an impact on their continuation in the teaching profession based on the findings of Watt and Richardson (2008b). In their study with graduating students, Watt and Richardson (2008b) put forth that the majority of

“highly engaged persisters”, who were revealed to be highly motivated compared to the other groups of graduating teachers taking part in the study, intended to pursue teaching for their whole career. Thus, the teaching motivation of the 4th-year pre-service EFL teachers in this study may be interpreted as a sign for their persistence in the profession of teaching.

Discussion of the Findings of Research Question 3: *Pre-Service EFL Teachers' Levels of TPACK*

Pre-service EFL teachers' technological pedagogical content knowledge was explored following similar steps to the analysis of their motivation to teach. Their general scores from the EFL-TPACK Scale were analyzed along with their scores on the PCK and TPCK subscales. Like in the case of their motivation to teach, the score means and score percentages against totals scores were explored to determine pre-service teachers' level of TPACK. The outcomes for the analysis of the mean scores showed that pre-service teachers' general TPACK mean score was close to 201 out of 245, while their PCK and TPCK mean values were around 87 out of 105 and 114 out of 140, respectively. The percentages of their scores gave a more comprehensible view of the mean values of pre-service teachers regarding the rate of each result against the other results. Though the percentages regarding the TPACK of pre-service teachers were not as close to each other as their percentages on the mean values of teaching motivation, their scores yielded similar results to each other in terms of their percentages against the total possible scores. Their general TPACK score and PCK subscale score resulted in percentages close to 82, while their TPCK subscale score was slightly below with a percentage of 81,5. This finding supported Solak and Çakır (2014), who revealed that TPACK and its sub-factors were correlated. The fact that their TPACK, PCK and TPCK scores were close to 82% for all categories indicated that their TPACK competence was close to high based on their scale results. This result was compatible with the findings of Sarıçoban et al. (2019), who concluded that pre-service EFL teachers' TPACK competence levels were found to be

moderate to high and that their levels were satisfactory. The fact that pre-service teachers had high levels of TPACK according to their scale results may be interpreted as an indication of their future technology integration. Lai et al. (2022) reported that TPACK had predictive power over teachers' technology use in their teaching. In a similar vein, Yang (2018) highlighted that TPACK levels of language teachers is one of the main factors for technology integration into teaching in a positive and active manner, and that TPACK can enable "valuable integration framework for teachers to enhance teaching quality by aid of technology creation dynamics" (p.369). Just as in-service teachers' TPACK signaled their technology integration, pre-service teachers' high TPACK levels may lead them to be willing to integrate technology more into teaching in their future careers.

From the results of their PCK and TPCK subscales, it was inferred that pre-service EFL teachers had similar bases regarding their pedagogical content knowledge and technological pedagogical content knowledge. Their paired samples t test results also indicated that there was a positive relation between the scores of pre-service teachers in the two subscales whereas their correlation was close to significant with a correlation value of 0,679. Though the paired sample t test reported that the mean value difference of their scores was significant statistically, the effect size calculation revealed that the effect size of the difference was small. Thus, it was concluded that the PCK and TPCK scores of pre-service teachers were close to each other and that they were almost equally competent in the two knowledge bases.

In terms of their TPACK levels according to geographical regions, it was observed that there was a difference in the TPACK levels of pre-service teachers in some regions. The results showed that pre-service teachers' TPACK scores in the Marmara Region had statistically lower mean values compared to the pre-service teachers in the Central Anatolia Region and the Mediterranean Region. This difference in mean scores on TPACK may be indicative of the difference in sample sizes of the regions due to the universities that participated in the study. One other reason may be the fact that the Marmara Region received the second lowest mean rank values compared to all other regions. However,

since the effect size of the difference was calculated to be small, this statistical difference was not perceived as an indicator of lower TPACK competence in the pre-service teachers in the Marmara Region. Thus, it was inferred that pre-service teachers in all regions had similar competency in TPACK.

Discussion of the Findings of Research Question 4: Perceptions of Pre-Service EFL Teachers Regarding Their TPACK and Their Motivation to Teach

The perceptions of pre-service EFL teachers regarding their TPACK and motivation to teach were explored through several interview questions. The thematic analysis of these interview questions revealed pre-service EFL teachers' views on their own TPACK and motivation to teach, their efforts to improve themselves in terms of these two phenomena along with their views on the effect of their faculty courses on their TPACK and their motivation to teach.

In terms of their TPACK, pre-service teachers primarily expressed their lack of competency in a specific knowledge area. They especially mentioned their lack of knowledge in technology. Their remarks on lack of knowledge in pedagogy and content appeared less frequently compared to their remarks on a lack of technological knowledge. This was similar to the outcome of the study by Qiu et al. (2022), who reported that pre-service Chinese-as-a-second-language teachers were least confident in their technology knowledge in their TPACK. This perceived lack of technological knowledge may be because of lack of opportunities to apply technological knowledge in their teaching contexts as not all pre-service teachers had similar experiences in their practicum. The pre-service teachers also expressed strength in a specific knowledge area and competency in general TPACK. Just as lack of technological knowledge was the primarily mentioned area in their expressions on lack of knowledge in a specific area, strength in technological knowledge was the primarily mentioned area when they expressed that they had strength in a specific area. This may as well be attributed to the opportunities pre-service teachers had in their teaching contexts in their practicum. Lack of competency in general TPACK was the least

frequent theme compared to the other themes. This was interpreted as an indicator that, though pre-service teachers articulated weaknesses as well as strengths in specific areas, they generally did not perceive themselves as incompetent in terms of TPACK. This was in line with the findings from the scale data as their results indicated that they had TPACK levels that could be considered high. Since teacher knowledge impacts teachers' classroom practices and student learning (Sarıçoban et al., 2019), pre-service teachers' high TPACK may be interpreted as a sign of their future effectiveness in their teaching career.

Their comments on their efforts to improve TPACK also resonated with their responses to the first question. Just as they mentioned lack of technology knowledge as the primary area for lack of knowledge in a specific area, their most prevalent responses for their efforts to improve their TPACK entailed their endeavors to improve technology integration into their teaching and technology use in their classrooms. They also mentioned usage of AI and online sources as an effort to improve their TPACK. The pre-service teachers' efforts in these two areas were perceived as an indicator that pre-service teachers were not only conscious about their weaknesses, but they also took initiatives to improve their perceived weaknesses.

Apart from their endeavor to compensate for their perceived lack of knowledge in technology, pre-service teachers' efforts also involved observation and reflection. Their statements on peer observation, reflection on their teaching, and feedback from other people were part of this theme. They also indicated teaching practice among their efforts to develop TPACK. The fact that pre-service teachers expressed that they observed others and reflected on their own teaching as well as engaging in teaching practice indicated their efforts to engage in reflective practice to an extent. These findings of the study in relation to pre-service teachers' efforts to improve their TPACK through peer observation, reflection on their teaching, and teaching practice itself are in line with the conclusion that Kurt et al. (2014) draw in their study on pre-service EFL teachers' lesson planning and technology integration. As they stated, "[f]ield experiences help PTs to understand the importance of planning and preparation, the value of specific instructional strategies and comprehend the

complexities involved in teaching with technology, thus developing their TPACK" (Kurt et al., 2014). Thus, based on the efforts of pre-service teachers to improve their TPACK, it was concluded that practicum experiences of pre-service teachers provided room for them to practice and improve the different aspects of their technological pedagogical content knowledge.

In terms of the effect of their faculty courses on their TPACK, pre-service teachers demonstrated conflicted views. The most prevalent theme that emerged from pre-service teachers' responses was contribution of courses to TPACK, which indicated that they perceived their courses as a facilitator of their TPACK development. However, inadequacy of courses in supporting TPACK was the second prevalent-occurring theme. This signaled that pre-service teachers' views were divided on the effect of the faculty courses. There was, however, a third suggestion by pre-service teachers regarding their instructors' impact. Some pre-service teachers highlighted the impact of their instructors rather than the courses as affecting their TPACK development. This implies that some of the pre-service teachers perceived their instructors as a source that contributed to their TPACK. This is in line with the findings of Koçoğlu (2009) and İşler and Yıldırım (2018). In her study, Koçoğlu (2009) also stated that pre-service teachers referred to the modeling of their instructors in using technology in class as an inspiration to integrate technology themselves. In a similar vein, İşler and Yıldırım (2018) indicated that pre-service teachers emphasized their instructors' support as a factor that influenced the development of their TPACK.

In terms of their motivation levels, pre-service teachers predominantly stated that they had motivation to teach. This was an expected outcome as motivation to teach has an impact on pre-service teachers from the beginning of their teacher education and refined through their pedagogical training (Watt & Richardson, 2008a). What differed among pre-service teachers in terms of their motivation to teach was the sources of their motivation that they articulated in response to the question on their motivation levels. Primarily, pre-service teachers' motivation was stated by themselves to be inherent, meaning that they either had inner motivation or motivation that stemmed from a purpose. These pre-service

teachers were perceived as those who chose the teaching profession on purpose rather than due to other causes such as convenience. Among the responses that formed the theme on inherent motivation, pre-service teachers provided included their love for their students and their love for teaching itself. The emergence of this as a primary theme is line with the literature on teacher motivation since the fundamental factor in terms of motivation is “teachers’ enjoyment of interacting with students—that is, of their main activity of teaching (Kunter, 2013, p. 283).”

Other sources mentioned by pre-service teachers were emergent or outsourced. Pre-service teachers whose motivation was described as emergent mentioned sources that facilitated their motivation to emerge. The most frequently mentioned source for the teaching motivation of pre-service teachers to emerge was their practicum experience. The fact that pre-service teachers articulated the emergence of their motivation through different processes involved in their teacher education reflected the dynamic nature that teacher motivations have (Richardson & Watt, 2010). This also indicated that hands-on practice with teaching provided opportunities for pre-service teachers to discover their motivation for the profession. Outsourced motivation of pre-service teachers was positioned as slightly different than emergent motivation as outsourced motivation was caused by a third party such as their educators or their students. This signaled that the involvement of other people in the process of pre-service teachers’ training journey did have an impact on their motivation for pursuing a career in teaching. As motivation to teach may denote persistence in the teaching profession (Watt & Richardson, 2008b), the pre-service teachers’ expressed motivation to teach may potentially impact their pursuit of a career in teaching for the long term in their professional lives regardless of the source of their motivation. As seen in the themes emerged, the factors that pre-service teachers repeatedly articulated were related to their teaching practice such as their love for teaching, the practicum experience, and their students. These patterns in the responses indicated that providing pre-service teachers with a higher level of engagement with classroom teaching practices is crucial.

Their efforts to improve their motivation to teach showed alignment with the sources mentioned by pre-service teachers to some extent. Increasing motivation through interaction with students and boosting motivation through preparation for teaching were two of the themes that emerged from pre-service teachers' responses. These efforts of pre-service teachers pointed to their practicum experience since their opportunities for interacting with students and teaching preparation was mostly possible through practicum as they were fourth-year students. Prompting motivation through practical implementations, on the other hand, involved practices such as peer collaboration, reflective practice and professional development and in-class implementations as sub-themes. As collaborative working environments in which teachers can depend on one another inherently results in an enhancement of teacher motivation (Yangın Ekşi et al., 2019), pre-service teachers practice of collaboration with their peers in their efforts to improve their motivation would be beneficial in terms of improving their teaching motivation. Pre-service teachers also indicated that they prepared for teaching not only through physical preparation but also through mental preparation. Considering such practices were adopted by pre-service teachers for teaching motivation implied that they actively tried to improve themselves not only about their TPACK but also about their motivation for the teaching profession. This outcome of the study is in accordance with what the literature suggests on motivation and value given to the profession. One of the central tenets in teacher education research is that teachers who have a sense of value for their profession will show greater effort and determination towards their work, which will lead to more favorable consequences (Kunter, 2013; Kunter & Holzberger, 2014). The findings of this study revealed that pre-service EFL teachers in this study did in fact show effort and had determination to enhance their motivation to teach. In-class implementations of pre-service teachers on their efforts to increase motivation, on the other hand, once again highlighted the importance of practicum for pre-service teachers as they likely found the chances to practice in-class implementations in their teaching practice classrooms.

When pre-service teachers were asked about the effects of their faculty courses on their motivation to teach, a similar pattern to their responses about the effects of courses on their TPACK emerged for this question as well. Their responses were conflicted regarding their courses' effects, though they were more negative compared to their responses on the effects of courses on their TPACK. Their responses predominantly denoted the inadequacy of their courses in supporting their motivation to teach. This was followed by their responses involving the contribution of course to their motivation to teach. Even though they referred to both the course inadequacy and support similar to the inadequacy and contribution of course to their TPACK, their responses' being primarily on the inadequacy of the courses provide support for their motivation indicated that they had a more adverse stance on the effect of courses in relation to motivation to teach. The fact that they also mentioned the contribution of instructors to their motivation to teach showed that they were influenced by their instructors at the faculty not only for the improvement of their TPACK but also for their motivation to pursue a career in teaching.

Discussion of the Findings of Research Question 5: Perceptions of the Academics in the EFL Departments Regarding Their Students' TPACK and Their Motivation to Teach

The EFL academics' perceptions regarding their students' TPACK and motivation to teach were explored through five of the interview questions on the academics' semi-structured interview form. The thematic analysis of these interview questions revealed the academics in EFL departments' views on their fourth-year EFL students' TPACK levels, their strengths and weaknesses in TPACK, the curricular and extracurricular opportunities provided for the development of their student' TPACK, and their motivation to teach.

In terms of the competency level of their fourth-years students' TPACK, the academics predominantly stated that their students' competency in technology knowledge was high. This was followed by their statements on the high TPACK of their students. The academics' responses to the second interview question on the strengths and weaknesses

of their students also revealed strength in technological knowledge as the predominant theme in their responses. The fact that the academics primarily referred to the competence of their students in technological knowledge not only in the second question but also in the first question inquiring their views on the general TPACK levels of their students implied that the academics' primary thoughts about the TPACK competence of their students predominantly point to their perceived predisposition in this regard. Even the views of the academics on their students' TPACK levels being high was overshadowed by the views on this specific area of TPACK knowledge in the responses to the first research question.

Apart from the strength of pre-service teachers in technological knowledge, the academics' views on the strengths and weaknesses of their fourth-year EFL students primarily included their lack of knowledge in content and lack of knowledge in pedagogy. This was in fact in contradiction with the second theme on students' having high TPACK that emerged from the academics' responses to the first question on the academics' views on their fourth-year EFL students' general TPACK levels. On the other hand, the views of academics on the competence and strength of their students in terms of their technological knowledge as demonstrated in the responses to the first two interview questions indicated that pre-service teachers may have been perceived by the academics as less competent in their content knowledge and their pedagogical knowledge compared to their assumed dominance in technological knowledge.

The academics' responses to the curricular opportunities provided for their fourth-year EFL students revealed only the theme named promoting technological knowledge and technology integration in courses. A variety of courses which promoted technological knowledge of pre-service teachers were mentioned by the academics. The responses of the academics reflected that the promotion of pre-service teachers' technological knowledge was recognized in the curriculum as well as the lecturers who instruct the courses. This finding of the study was in alignment with the study of Ada and Altay (2022), which highlighted the superiority of instructors in English Language Teaching departments in relation to their use of technology. Likewise, the study also supported Aşık et al.'s (2020)

argument on teacher educators' modelling for educational technology use in language teacher education programs. The predominance of the responses on such courses that promote technological knowledge and technology integration also may be a reason for the perceived strength of the pre-service teachers in technological knowledge. In terms of the extracurricular resources for pre-service teachers' TPACK improvement, however, the responses revealed two themes named as encouragement to take initiatives outside the courses and lack of extracurriculars for TPACK. In neither one of these themes did the academics mention an extracurricular provided specifically with the aim of developing pre-service teachers' TPACK. In the responses involved in the first theme on the encouragement to take initiatives outside the courses, the academics referred to different opportunities provided to pre-service teachers that may indirectly help their TPACK development.

When the academics were asked about their fourth-year EFL students' motivation to teach, only two themes emerged. The primary theme that emerged from the responses involved pre-service teachers' lack of motivation, which was followed by the academics' statements on pre-service teachers' being motivated or excited to teach that formed the second theme. The fact that the academics' responses revealed the lack of motivation theme over the theme on pre-service teachers' motivation and excitement indicated that the academics predominantly believed their students to be deficient in their teaching motivation rather than having enough motivation to teach.

Conclusion

This section presented the findings of the analysis carried out for the research questions of this study. The analysis was followed by comments and discussion on the main findings of the analysis. The following section will present the summary of the study as well as the conclusion, pedagogical implications, limitations of the study and suggestions for further research.

Chapter 5

Conclusion and Suggestions

Introduction

This chapter first provides a summary of the study. Next pedagogical implications based on the findings of the study are presented. Then the limitations of the study are explained and finally suggestions for further research are explored.

Summary of the Study

This study investigated the relationship between the TPACK levels and teaching motivation of fourth-year pre-service EFL teachers in Turkish public universities. The participants of the study were 374 fourth-year pre-service EFL teachers determined through stratified random sampling. Nine academics from seven universities also participated in the study. The data was collected from sixteen public universities over the course of seven months during the 2023-2024 academic year. The study followed a mixed-method research design with the data collection and data analysis processes involving qualitative and quantitative methods. The quantitative data was collected through scales and analyzed through regression analysis, descriptive statistics, Kruskal Wallis test, paired samples t test, and one-way ANOVA test while the qualitative data was analyzed through thematic analysis. The data was collected through scales, group interviews and individual interviews. The scale data was collected from fifteen universities and 374 pre-service teachers while the group interviews involved six groups and eighteen pre-service teachers. Individual interviews were conducted with nine academics.

The data collection process was carried out through the EFL-TPACK Scale (Wang, 2022), Motivation to Teach Scale (Kauffman et al., 2011), the semi-structured form for pre-service teachers, and the semi-structured interview form for academics. The semi-structured interview forms were developed by the researcher for this study in consultation with EFL experts. All research instruments were piloted for the reliability of the research

instruments within the context of pre-service EFL teacher education. In the actual study, the data collection through the scales was carried out prior to the data collection through the semi-structured interview forms. The group interviews with the pre-service teachers were implemented prior to the interviews with the academics. The data analysis process was first carried out for the scale data and then the interview data collected from the pre-service teachers and academics.

The findings of the simple linear regression analysis indicated that pre-service teachers' TPACK and motivation to teach were positively correlated though they had minimal predictive power over each other. While this was the case, the regression coefficients revealed that the impact of motivation to teach over TPACK was statistically higher compared to the impact of TPACK over motivation to teach. While the regression analysis revealed moderate correlation between TPACK and motivation to teach, the interviews conducted with pre-service teachers and academics indicated that both groups believed the two phenomena to be related to each other, though they attributed a more dominant relationship between these than what the results of the regression analysis suggested. The pre-service teachers also articulated prevalently on the impact of motivation to teach over TPACK compared to the impact of TPACK over motivation to teach, which aligned with the outcomes of the regression analysis on the relationship of TPACK and motivation to teach. However, the impact of TPACK over motivation to teach was articulated by the academics instead of the opposite.

The exploration of the pre-service teachers' levels of motivation to teach indicated that their general motivation levels were moderately high which aligned with the findings of previous research (Başöz, 2021; Cengiz, 2023). Their intrinsic and extrinsic motivation were also highly correlated and similar to each other based on the paired samples t test results and their percentages. The motivation levels were also observed to be similar across geographical regions. In terms of the TPACK levels of pre-service teachers, the results of the analysis indicated that their TPACK level results were higher compared to their teaching

motivation levels. Their TPACK levels were also observed to be close to high in general. Their TPACK levels as well as their PCK and TPCK levels were also similar to each other in terms of their percentages. The paired samples t test results for the PCK and TPCK of pre-service teachers also indicated that the correlation between the two was close to significant. The TPACK levels of pre-service teachers by geographical regions were mostly similar to each other, though some regions demonstrated small differences.

Based on the perceptions of pre-service teachers regarding their TPACK, it was seen that they primarily expressed lack of knowledge in a specific area of their TPACK, especially in terms of technological knowledge. Their responses also revealed themes on their strength in a specific knowledge area as well as competency in general TPACK. They specifically mentioned strength in technological knowledge when discussing their strength in a specific area of their TPACK. They also expressed during the semi-structured interviews that their efforts to improve their TPACK involved their endeavors to improve technology integration into their teaching and technology use in their classrooms, use of AI and online resources, observation and reflection, as well as engaging in teaching practice. Their views on the impact of their faculty courses on their TPACK revealed that the pre-service teachers prevalently articulated the contribution of the course to their TPACK while they also discussed the inadequacy of courses in supporting TPACK and the impact of their instructor on their TPACK over the impact of the courses.

Their perceptions on their levels of motivation to teach indicated that they were primarily motivated through a variety of motivation sources. The prevalent source of motivation was inherent, including motivation sources such as the love of the profession. Other motivation sources mentioned by the pre-service teachers were emergent and outsourced, respectively. Among the sources of emergent motivation, practicum was frequently mentioned as a source for motivation to emerge in pre-service teachers. For outsourced motivation, pre-service teachers mentioned sources such as their educators or their students for the sources that prompted their motivation to teach. Their efforts to

improve their motivation to teach also involved interaction with students, preparation for teaching, practical implementations such as peer collaboration, and in-class implementations. Their views on the impact of their faculty courses showed that the pre-service teachers' remarks primarily reflected the inadequacy of their courses in supporting their motivation to teach while they secondly mentioned the contribution of their faculty courses to their motivation. They also mentioned the impact of their instructors once again, this time in relation to their motivation to teach.

The interviews with the academics in the EFL departments revealed their perceptions on their students' TPACK and motivation to teach. Their views on the general level of their students' TPACK revealed that they primarily believed their students to have high competence in technological knowledge, followed by their expressions on their students' TPACK being high. Their perceptions on the strengths and weaknesses of their students in terms of their TPACK also revealed technological knowledge as a primarily articulated strength, while lack of content knowledge and lack of pedagogical knowledge were expressed respectively, following the prevalent theme on the strength of pre-service teachers in technological knowledge. For the curricular and extracurricular opportunities provided for the pre-service teachers to support their TPACK, the academics predominantly stated that they promoted technological knowledge and technology integration in courses to support the TPACK of pre-service teachers, while they encouraged pre-service teachers to take initiatives outside the courses to develop their TPACK. In terms of the motivation levels of fourth-year pre-service EFL teachers, the academics' primary responses revealed that they perceived their students as lacking motivation while some academics also articulated that their students were motivated or excited to teach.

Pedagogical Implications

This research contributes to the exploration of TPACK and teaching motivation of pre-service EFL teachers by providing insights into the current status quo as well as

demonstrating the perspectives of both pre-service teachers and academics in EFL departments at public universities in Türkiye. This section presents the pedagogical implications of the study in relation to pre-service teachers, academics, pre-service teacher education and teacher identity development.

The exploration of pre-service teachers' TPACK and motivation to teach not only uncovered their levels but also the relation between them. Based on this study, it is deduced that the two phenomena are in fact related, though not so strongly as to have significant predictive power over one another. Still, the results indicated that the impact of motivation to teach over TPACK was higher than the opposite direction. In terms of the perspectives of the pre-service teachers and academics also indicated a relation between the two constructs, with pre-service teachers expressing that their motivation to teach had an impact over their TPACK more frequently than the impact of their TPACK on their motivation. These findings provide implications on the nature of pre-services' teacher identity construct. Their emphasis of their motivation to teach over their TPACK as well as the results of the regression analysis regarding the impact of motivation to teach over TPACK demonstrates that pre-service teachers' motivation precedes their knowledge base in terms of their teacher identity.

Pre-service teachers nowadays are expected to have high technological knowledge, and thus perceived as competent in this aspect of their TPACK. The views of the academics were in line with this perspective as they primarily perceived their students as having high competence in technological knowledge. The pre-service teachers' views, however, set forth a different picture as they expressed having lack of technological knowledge more than being competent in this aspect. Though their results for their TPACK levels based on the EFL-TPACK Scale were close to high and that the academics stated that the courses provided at their faculties provided opportunities to promote technological knowledge, the pre-service teachers' self-perceptions on this aspect of their knowledge base was not satisfactory for them. The scale results based on their PCK and TPCK levels also indicated

that the second sub-dimension shortly fell behind the first one in terms of the percentages, indicating that the technological knowledge aspect of their knowledge base was slightly less strong. The cumulative outcome of these findings suggested that pre-service teachers may be in need of further instruction or encouragement in terms of their competence in technological knowledge during their pre-service teacher education. Having strong TPACK may be accepted as an indication of teachers' efficacy in the classroom for adopting technology and promoting student learning (Sarıçoban et al., 2019); thus, supporting pre-service EFL teachers to improve their technological knowledge is essential in order to optimize their TPACK in all aspects. On this note, Qui et al. (2022) also stated that pre-service teachers' TPACK needs to be better supported through teacher education. As providing TPACK training to pre-service teachers promotes an increased level of awareness of the use of technology in integration with pedagogy and content (Solak & Çakır, 2014), promoting courses in pre-service English language teacher training programs that are specifically designed for the purpose of improving pre-service teachers' awareness and understanding of TPACK may be beneficent in terms of improving the overall TPACK of pre-service teachers. On this note, Öz (2015) also suggested that integrating TPACK into teacher education can support quality in learning and teaching.

The findings of the study also suggested that practicum plays an important role in pre-service teachers' TPACK as well as their motivation to teach. The pre-service teachers frequently referred to their teaching experience during the interviews as a place that provided opportunities for demonstrating their TPACK competency as well as a facilitator for their motivation to teach. The role that practicum and field work plays on teacher candidates' professional development is recognized within the field (Kurt et al., 2014). Practicum provides pre-service teachers with opportunities to juxtapose the theoretical insights they acquired during their pre-service training with the practical circumstances encountered in real educational environments (Yangin Eksi & Gungor, 2018). Thus,

integration of coursework with field work in teacher education programs is suggested in the literature for better technology integration (Kurt et al., 2014).

Practicum experience is at the core of teacher education programs with teacher candidates undertaking some of the aspects of a teacher's role and having real contact with the demands of the profession for the first time (Watt & Richardson, 2008b, p. 424). Practicum also constitutes the first place in which pre-service teachers improve their theoretical and practical experiences (Yakışık et al., 2019). The fact that the pre-service teachers referred to practicum frequently and attributed such an importance to their experience during practicum demonstrates that practicum plays a vital role both in teacher education and pre-service teachers' development. Thus, the study suggests that pre-service teachers' teaching experience practices need to be emphasized more during teacher education. The pre-service teachers' expressions on the emergence of their motivation during practicum and as well as its impact on their TPACK set out the centrality of practicum to teacher education. Thus, it may also be considered that teaching experience may be introduced to pre-service teachers earlier during their pre-service teacher education rather than confining this important element of teacher education to the final year of teaching. Naturally, it is possible that pre-service teachers may not be as productive in the practicum because they do not have as much subject and pedagogical knowledge in the periods before the fourth year of their education as they do in this period. However, it may be possible for them to attend classroom observations in the periods before their final year, and in this way, they may get acquainted with the requirements of the profession earlier and thus prepare themselves accordingly.

Limitations of the Study

The present study investigated fourth-year pre-service EFL teachers' TPACK and motivation and the relationship between the two phenomena and provided insights into the current status quo. However, the study is not without limitations.

One limitation of this study is related to the multifaceted nature of TPACK and motivation to teach. Both constructs consist of different dimensions that may interplay with each other in ways more varied than explored here. The teaching motivation of pre-service teachers were explored based on their general motivation levels consisting of the dimensions of intrinsic and extrinsic motivation whereas TPACK was explored based on the PCK and TPCK dimensions in accordance with the purposes of this study. The other sub-dimensions of TPACK may have different relations to motivation to teach than what was investigated in this study. Likewise, the other dimensions of motivation may interact differently with students' TPACK.

Another limitation of the study concerns the data collection of the study. The study relied on self-report data collection tools such as scales and semi-structured interview forms due to resource and time limitations. The self-report of pre-service EFL teachers as well as academics only represent the personal views and perceived status of the participants in terms of the TPACK and teaching motivation of pre-service teachers.

The final limitation that was perceived by the researcher was in relation to the span of data collection. As the study focused on fourth-year pre-service EFL teachers, the data collection procedure took place over the course of their final year at their faculties and their TPACK and motivation to teach during this period of time. Their motivation to teach and TPACK prior to their final year as well as after their graduation has not been explored in a longitudinal manner, which limits the study for comparing the development of these two phenomena over the course of time.

Suggestions for Further Research

This section of the study provides suggestions for further research in accordance with the findings as well as the limitations of the study discussed in previous sections.

The present study explored motivation to teach and TPACK based on the sub-dimensions of intrinsic and extrinsic motivation and the subdimensions of PCK and TPCK.

Due to the multifaceted nature of both phenomena, research exploring the different dimensions of the two constructs in relation to each other can provide further insights into the complex interplay of the two phenomena. The data collected from the pre-service teachers involved scale and interview data whereas the data from the academics was collected through interviews. Thus, the study relied on self-report data collection tools only. Research that adopts more varied data collection tools such as observations in order to rule out any self-report bias that may exist in the data collected from the participants.

This research focused on pre-service EFL teachers' TPACK and motivation to teach during their fourth and final year in their teacher education departments. Thus, the results of the study reports the status quo of pre-service teachers during their pre-service teachers education. The exploration of their TPACK and motivation to teach when they start their teaching career upon graduation has the potential to provide important insights as well as feedback for teacher education programs. The implementation of longitudinal studies over the course of pre-service teacher education programs can also contribute to the understanding of the development of pre-service teachers' TPACK and motivation to teach as well as the interaction of the two constructs throughout their pre-service teacher education.

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APPENDIX-A: Informed Consent Form for the Scale Implementation with Pre-Service Teachers

Değerli Katılımcı,

Yapacak olduğum araştırma için ayırdığınız zaman ve ilgili tavrınız için şimdiden çok teşekkür ederim. Gönüllü katılım formu ile ne amaçladığımı ve çalışmaya katılmanız durumunda çalışma boyunca neler yapacağımızı anlatmayı amaçladım.

Bu çalışma, Hacettepe Üniversitesi Eğitim Bilimleri Enstitüsü doktora öğrencisi Reyyan Zülal YÖNEY tarafından, Prof. Dr. Elena ANTONOVA-ÜNLÜ danışmanlığında hazırlanacak bir doktora tezinin bir parçasıdır. Araştırma, İngilizce Öğretmenliği programlarında öğrenim gören dördüncü sınıf öğrencilerinin teknolojik pedagojik alan bilgisi (TPAB) ile öğretme motivasyonları arasındaki ilişkiyi ortaya çıkarmayı amaçlanmaktadır. *Bu çalışmanın yapılabilmesi için Hacettepe Üniversitesi Sosyal ve Beşerî Bilimler Araştırma Etik Kurulu'ndan gerekli izin alınmıştır.*

Araştırmaya **gönüllü olarak katılım** esastır. Gönüllü olduğunuz takdirde size dağıtılacak olan ölçek formlarını doldurmanızı rica ediyorum. Ölçek sonuçları sadece bilimsel bir amaç için kullanılacak ve bunun haricinde hiçbir şekilde kullanılmayacaktır. İstediğiniz takdirde size ait ölçek formları imha edilecek ya da size geri verilecektir. Araştırma süresince gerçek adınız yerine takma bir ad kullanılacaktır. İstediğiniz zaman çalışmadan ayrılabilirsiniz. Böyle bir durumda sizden elde edilen ölçek formları çalışma için kullanılmayacaktır.

Ölçek uygulama süreci sonrasındaki bir tarihte yine gönüllü katılım sağlamak isteyen kişilerle odak grup görüşmeleri yapılacaktır. Grup görüşmeleri aynı üniversitede İngilizce Öğretmenliği programında okumakta olan öğrencilerden gönüllü olanlarla birlikte yapılacak olup, yine teknolojik pedagojik alan bilgisi (TPAB) ile öğretme motivasyonuna yönelik sorular içeren bir görüşme formatında olacaktır. Görüşmeye katılmaya gönüllü olan öğrencilerin Evet kutucuğunu işaretlemeleri ve görüşme için iletişime geçebilmesi için e-posta ya da telefon bilgilerini ilgili kısma yazmaları gerekmektedir.

Bu bilgiler ışığında araştırmaya gönüllü katılımınızı ve sağladığım güvenceye dayanarak bu formu imzalamanızı rica ediyorum. Sormak istediğiniz herhangi bir durumda ya da araştırma sonucu hakkında bilgi almak istediğinizde benimle her zaman iletişime geçebilirsiniz. İlgili prosedürü onaylıyor ve elde edilen verinin bilimsel araştırma amacıyla kullanılmasına izin veriyorsanız lütfen aşağıda üniversite ve ad soyad bilgisi kısmını doldurup formu imzalayınız. Katılımınız için teşekkür ederim.

Sorumlu Araştırmacı:
Prof. Dr. Elena ANTONOVA-ÜNLÜ
Adres: Hacettepe Üniversitesi Eğitim Fakültesi Yabancı Diller Eğitimi Bölümü

Araştırmacı:
Reyyan Zülal YÖNEY
Adres: Gebze Teknik Üniversitesi Yabancı Diller Bölümü
e-posta:

Gönüllü Katılımcının
Üniversitesi:
Adı Soyadı:
Cinsiyet:
İmzası:

Odak grup görüşmelerine katılmak istiyor musunuz?

☐Evet ☐Hayır

Evet ise e-posta ve / ya da telefon bilgisi:

……

APPENDIX-B: Informed Consent Form for the Semi-Structured Interviews with Pre-Service Teachers

Değerli Katılımcı,
Yapacak olduğum araştırma için ayırdığınız zaman ve ilgili tavrınız için şimdiden çok teşekkür ederim. Gönüllü katılım formu ile ne amaçladığımı ve çalışmaya katılmanız durumunda çalışma boyunca neler yapacağımızı anlatmayı amaçladım.
Bu çalışma, Hacettepe Üniversitesi Eğitim Bilimleri Enstitüsü doktora öğrencisi Reyyan Zülal YÖNEY tarafından, Prof. Dr. Elena ANTONOVA-ÜNLÜ danışmanlığında hazırlanacak bir doktora tezinin bir parçasıdır. Araştırma, İngilizce Öğretmenliği programlarında öğrenim gören dördüncü sınıf öğrencilerinin teknolojik pedagojik alan bilgisi (TPAB) ile öğretme motivasyonları arasındaki ilişkiyi ortaya çıkarmayı amaçlanmaktadır. Bu çalışmanın yapılabilmesi için Hacettepe Üniversitesi Sosyal ve Beşerî Bilimler Araştırma Etik Kurulu'ndan gerekli izin alınmıştır.
Araştırmaya gönüllü olarak katılım esastır. Gönüllü olduğunuz takdirde bu süreçte sizinle görüşme yapmak ve görüşme sırasında ses ve/veya video kaydı almak istiyorum. Bütün bu kayıtlar ve görüşmeler sadece bilimsel bir amaç için kullanılacak ve bunun haricinde hiçbir şekilde kullanılmayacaktır. Görüşme kayıtları ilgili araştırmacı dışında kimse tarafından izlenmeyecektir. İstediğiniz takdirde görüşme notları ve kayıtlar silinebilecek ya da size geri verilecektir. Araştırma süresince gerçek adınız yerine takma bir ad kullanılacaktır. İstediğiniz zaman çalışmadan ayrılabilirsiniz. Böyle bir durumda sizden elde edilen gözlem notları ve kayıtlar çalışma için kullanılmayacaktır.
Bu bilgiler ışığında araştırmaya gönüllü katılımınızı ve sağladığım güvenceye dayanarak bu formu onaylamanızı rica ediyorum. Aşağıdaki "Çalışmaya gönüllü katılmayı kabul ediyorum." ifadesi yanında bulunan kutucuğu işaretlemeniz halinde çalışmaya katılmayı kabul etmiş sayılacaksınız. Sormak istediğiniz herhangi bir durumda ya da araştırma sonucu hakkında bilgi almak istediğinizde benimle her zaman iletişime geçebilirsiniz. İlgili prosedürü onaylıyor ve elde edilen verinin bilimsel araştırma amacıyla kullanılmasına izin veriyorsanız lütfen aşağıda ad soyad bilgisi kısmını doldurup ilgili kutucuğu işaretleyiniz. Katılımınız için teşekkür ederim.

Sorumlu Araştırmacı:
Prof. Dr. Elena ANTONOVA-ÜNLÜ
Adres: Hacettepe Üniversitesi Eğitim Fakültesi Yabancı Diller Eğitimi Bölümü

Araştırmacı:
Reyyan Zülal YÖNEY
Adres: Gebze Teknik Üniversitesi Yabancı Diller Bölümü
e-posta:

Gönüllü Katılımcının
Üniversitesi:
Rumuz:

Bu çalışmaya gönüllü katılmayı kabul ediyorsanız lütfen aşağıdaki kutucuğu işaretleyiniz.
□Bu çalışmaya gönüllü katılmayı kabul ediyorum.

APPENDIX-C: Informed Consent Form for the Semi-Structured Interviews with Academics

Değerli Katılımcı,
Yapacak olduğum araştırma için ayırdığınız zaman ve ilgili tavrınız için şimdiden çok teşekkür ederim. Gönüllü katılım formu ile ne amaçladığımı ve çalışmaya katılmanız durumunda çalışma boyunca neler yapacağımızı anlatmayı amaçladım.
Bu çalışma, Hacettepe Üniversitesi Eğitim Bilimleri Enstitüsü doktora öğrencisi Reyyan Zülal YÖNEY tarafından, Prof. Dr. İsmail Hakkı Mirici danışmanlığında hazırlanacak bir doktora tezinin bir parçasıdır. Araştırma, İngilizce Öğretmenliği programlarında öğrenim gören dördüncü sınıf öğrencilerinin teknolojik pedagojik alan bilgisi (TPAB) ile öğretme motivasyonları arasındaki ilişkiyi ortaya çıkarmayı amaçlanmaktadır. Bu çalışmanın yapılabilmesi için Hacettepe Üniversitesi Sosyal ve Beşerî Bilimler Araştırma Etik Kurulu'ndan gerekli izin alınmıştır.
Araştırmaya gönüllü olarak katılım esastır. Gönüllü olduğunuz takdirde bu süreçte sizinle görüşme yapmak ve görüşme sırasında ses ve/veya video kaydı almak istiyorum. Bütün bu kayıtlar ve görüşmeler sadece bilimsel bir amaç için kullanılacak ve bunun haricinde hiçbir şekilde kullanılmayacaktır. Görüşme kayıtları ilgili araştırmacı dışında kimse tarafından izlenmeyecektir. İstediğiniz takdirde görüşme notları ve kayıtlar silinebilecek ya da size geri verilecektir. Araştırma süresince gerçek adınız yerine takma bir ad kullanılacaktır. İstediğiniz zaman çalışmadan ayrılabilirsiniz. Böyle bir durumda sizden elde edilen gözlem notları ve kayıtlar çalışma için kullanılmayacaktır.
Bu bilgiler ışığında araştırmaya gönüllü katılımınızı ve sağladığım güvenceye dayanarak bu formu onaylamanızı rica ediyorum. Aşağıdaki "Çalışmaya gönüllü katılmayı kabul ediyorum." ifadesi yanında bulunan kutucuğu işaretlemeniz halinde çalışmaya katılmayı kabul etmiş sayılacaksınız. Sormak istediğiniz herhangi bir durumda ya da araştırma sonucu hakkında bilgi almak istediğinizde benimle her zaman iletişime geçebilirsiniz. İlgili prosedürü onaylıyor ve elde edilen verinin bilimsel araştırma amacıyla kullanılmasına izin veriyorsanız lütfen aşağıda ad soyad bilgisi kısmını doldurup ilgili kutucuğu işaretleyiniz. Katılımınız için teşekkür ederim.

Sorumlu Araştırmacı:
Prof. Dr. Elena ANTONOVA-ÜNLÜ
Adres: Hacettepe Üniversitesi Eğitim Fakültesi Yabancı Diller Eğitimi Bölümü

Araştırmacı:
Reyyan Zülal YÖNEY
Adres: Gebze Teknik Üniversitesi Yabancı Diller Bölümü
e-posta:

Gönüllü Katılımcının
Üniversitesi:
Rumuz:

Bu çalışmaya gönüllü katılmayı kabul ediyorsanız lütfen aşağıdaki kutucuğu işaretleyiniz.
□Bu çalışmaya gönüllü katılmayı kabul ediyorum.

APPENDIX-D: Motivation to Teach Scale

Nickname:
University:

The following items ask you about why you have chosen to enter the teaching profession. For each item, please use the scale below to CIRCLE the number corresponding to the response that best represents your feelings. There are no right or wrong answers.

	STATEMENTS	Strongly disagree	Disagree	Somewhat disagree	Somewhat agree	Agree	Strongly agree
01	I chose teaching because it will help me get a better position in the future.	1	2	3	4	5	6
02	I cannot imagine a career more enjoyable than teaching.	1	2	3	4	5	6
03	I chose teaching because I like the freedom it provides.	1	2	3	4	5	6
04	I chose teaching because a teaching degree will make me employable just about anywhere.	1	2	3	4	5	6
05	I get excited when I talk to others about my decision to become a teacher.	1	2	3	4	5	6
06	I chose teaching because as a teacher I will be respected throughout the community.	1	2	3	4	5	6
07	I chose teaching because the benefits are good.	1	2	3	4	5	6
08	I want to teach for the sheer joy of teaching.	1	2	3	4	5	6
09	I teach because I believe it will give me a sense of deep personal fulfillment.	1	2	3	4	5	6
10	I chose to enter the teaching profession because teachers have influence in the community.	1	2	3	4	5	6
11	Teaching is its own reward.	1	2	3	4	5	6
12	I want to teach simply for the sake of teaching.	1	2	3	4	5	6

Kauffman, D. F., Yılmaz Soylu, M., & Duke, B. (2011). Validation of the motivation to teach scale. *H. U. Journal of Education, 40,* 279-290.

APPENDIX-E: EFL-TPACK Scale

Nickname:
University:
Please indicate your level of agreement with each statement from the perspective of a teacher of English.

PCK1	English Teaching Strategies: Such as teaching techniques, methods, or classroom management	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
01	I can select appropriate and effective teaching strategies for teaching English to children.	☐	☐	☐	☐	☐
02	I can select appropriate and effective teaching strategies that help children remember English words, phrases, or sentences.	☐	☐	☐	☐	☐
03	I can select appropriate and effective teaching strategies that help children understand English words, phrases, or sentences.	☐	☐	☐	☐	☐
04	I can select appropriate and effective teaching strategies that help children use English to communicate, negotiate, or acquire information.	☐	☐	☐	☐	☐
05	I can select appropriate and effective teaching strategies that help children categorize, associate, or integrate knowledge in different fields.	☐	☐	☐	☐	☐
06	I can select appropriate and effective teaching strategies that help children compare and evaluate different ideas.	☐	☐	☐	☐	☐
07	I can select appropriate and effective teaching strategies that help children design or create English works.	☐	☐	☐	☐	☐
PCK2	**English Assessments: Such as tests, surveys, worksheets, assignments, tasks, and so on**	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
08	I can develop evaluation tests and surveys for my English class.	☐	☐	☐	☐	☐
09	I can develop assessments to check how children remember English words, phrases, or sentences.	☐	☐	☐	☐	☐
10	I can develop assessments to test how children understand English words, phrases, or sentences.	☐	☐	☐	☐	☐
11	I can develop assessments to evaluate how children use English to communicate with others in different situations.	☐	☐	☐	☐	☐
12	I can develop assessments to observe how children use English to analyze similarities and differences among people or things in different situations.	☐	☐	☐	☐	☐

13	I can develop assessments to examine how children use English to evaluate and make optimal decisions.	☐	☐	☐	☐	☐
14	I can develop assessments to distinguish how children use English to design or create works.	☐	☐	☐	☐	☐
PCK3	**English Instructional Design: Such as lesson planning, objective setting, and activity designing**	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
15	I can prepare a lesson plan including activities that help children learn.	☐	☐	☐	☐	☐
16	I can prepare a lesson plan including activities that help children identify or search for English words, phrases, or sentences.	☐	☐	☐	☐	☐
17	I can prepare a lesson plan including activities that help children understand or explain English words, phrases, or sentences.	☐	☐	☐	☐	☐
18	I can prepare a lesson plan including activities that help children communicate with others in English.	☐	☐	☐	☐	☐
19	I can prepare a lesson plan including activities that help children categorize or analyze different ideas, things, or people.	☐	☐	☐	☐	☐
20	I can prepare a lesson plan including activities that help children assess and present their preferences.	☐	☐	☐	☐	☐
21	I can prepare a lesson plan including activities that help children design or create their English works.	☐	☐	☐	☐	☐
TPCK1	**Technological Tools: ex. computer software, eBooks, websites, APPs, VR, collaboration tools**	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
22	I know about technologies that I can use for understanding and teaching children English.	☐	☐	☐	☐	☐
23	I know about technologies that I can use to display information and help children memorize English words or sentence patterns.	☐	☐	☐	☐	☐
24	I know about technologies that I can use to indicate meanings and help children understand English words or sentence patterns.	☐	☐	☐	☐	☐
25	I know about technologies that I can use to help children communicate with others in English.	☐	☐	☐	☐	☐

26	I know about technologies that I can use to help children integrate knowledge from the English field with other course fields.	☐	☐	☐	☐	☐
27	I know about technologies that I can use to help children compare their own ideas with their peers.	☐	☐	☐	☐	☐
28	I know about technologies that I can use to help children express their voices and create their own English works.	☐	☐	☐	☐	☐
TPCK2	**Technological Instructional Design: Such as designing multimedia-assisted English activities**	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
29	I can select technologies to use in my English classroom that enhance who I teach, how I teach and what I teach.	☐	☐	☐	☐	☐
30	I can select technologies for children to use to identify or search for English words, phrases, or sentences.	☐	☐	☐	☐	☐
31	I can select technologies for children to use to explain or summarize the English content they are learning.	☐	☐	☐	☐	☐
32	I can select technologies for children to use to communicate with others in different situations.	☐	☐	☐	☐	☐
33	I can select technologies for children to use to compare, connect, or analyze information and experience in different fields.	☐	☐	☐	☐	☐
34	I can select technologies for children to use to make comments or share opinions in English.	☐	☐	☐	☐	☐
35	I can select technologies for children to use to plan their projects or create their English works.	☐	☐	☐	☐	☐
TPCK3	**Technological Teaching Strategies: Integrating English content, English teaching methods, and instructional technology to teach English**	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
36	I can integrate appropriate instructional methods and technologies into teaching English.	☐	☐	☐	☐	☐
37	I can integrate English teaching strategies and technological tools to help children memorize English words, phrases, or sentences.	☐	☐	☐	☐	☐
38	I can integrate English teaching strategies and technological tools to help children do meaningful comprehension activities.	☐	☐	☐	☐	☐
39	I can integrate English teaching strategies and technological tools to help children use English to communicate, negotiate, or acquire information.	☐	☐	☐	☐	☐

40	I can integrate English teaching strategies and technological tools to help children connect their knowledge in the English course field with other course fields.	☐	☐	☐	☐	☐
41	I can integrate English teaching strategies and technological tools to help children share their opinions about things or people around them.	☐	☐	☐	☐	☐
42	I can integrate English teaching strategies and technological tools to help children design or create their own English works.	☐	☐	☐	☐	☐
TPCK4	**English Learning Outcomes: Integrating English content, teaching methods, and technology to help children achieve the stated outcomes**	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
43	I can teach successfully by combining my English content, pedagogy, and technology knowledge.	☐	☐	☐	☐	☐
44	I can integrate English content, teaching methods, and technology to help children identify, search, or indicate the targeted English objective.	☐	☐	☐	☐	☐
45	I can integrate English content, teaching methods, and technology to help children explain, summarize, or give examples for the targeted English objective.	☐	☐	☐	☐	☐
46	I can integrate English content, teaching methods, and technology to help children negotiate, communicate, or acquire information in English.	☐	☐	☐	☐	☐
47	I can integrate English content, teaching methods, and technology to help children compare, categorize, or analyze English information in different fields.	☐	☐	☐	☐	☐
48	I can integrate English content, teaching methods, and technology to help children comment or express personal opinions about people or things around them.	☐	☐	☐	☐	☐
49	I can integrate English content, teaching methods, and technology to help children design or create English works.	☐	☐	☐	☐	☐

Wang, A. Y. (2022). Understanding levels of technology integration: A TPACK scale for EFL teachers to promote 21st century learning. *Education and Information Technologies, 27*, 9935–9952.

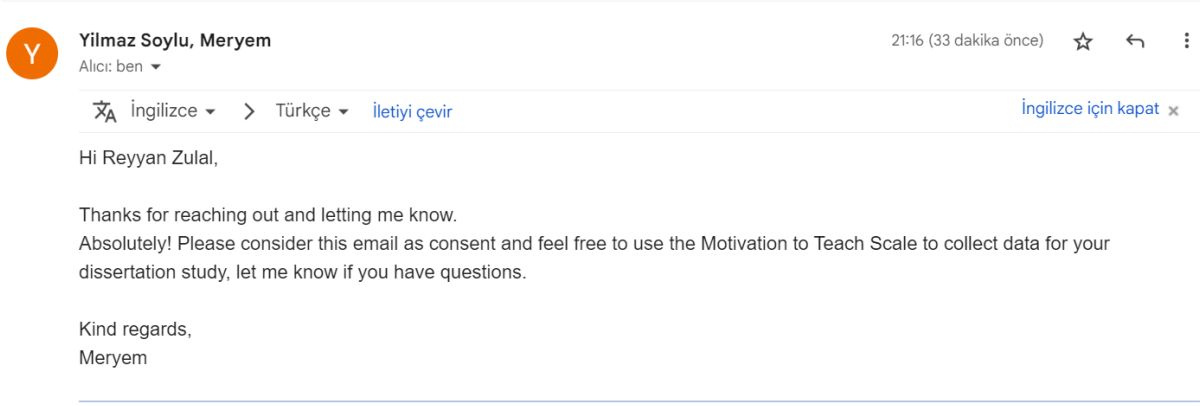
APPENDIX-F: Semi-Structured Interview Form for Pre-Service Teachers

1. How do you assess your technological pedagogical content knowledge (TPACK)? How do you define your competency level of TPACK?
2. How do you explain your effort to develop your TPACK? What do you do to develop your TPACK?
3. How do you assess the effect of your faculty courses on your TPACK? How do the courses you take at your faculty contribute to your TPACK? Apart from the courses, is there any other resource that your faculty provide to support your TPACK?
4. How do you assess your motivation to teach? How motivated are you to teach?
5. How do you define your effort to improve your motivation to teach? Is there anything you do to increase your motivation to teach?
6. How do you assess the effect of your faculty courses to your motivation to teach? How do the courses you take at your faculty contribute to your motivation to teach? Apart from the course, is there any other resource that your faculty provide to support your motivation to teach?
7. How do you define the relationship between your TPACK and your motivation to teach? Do you think there is a relationship between them? If so, how do they relate to each other?

APPENDIX-G: Semi-Structured Interview Form for Academics

1. How do you assess your students' technological pedagogical content knowledge (TPACK) competency level?
2. In which areas of their TPACK do you think they have strength? In which areas do you think they need to develop their TPACK?
3. What kind of curricular materials and courses do you provide for your students to improve their TPACK levels? Within the curriculum, is there anything else you do or implement to support their TPACK?
4. What kind of extra-curricular materials, resources, and workshops do you provide for your students to improve their TPACK levels? Apart from the curriculum, is there anything else you do or implement to support their TPACK?
5. How do you assess your students' motivation to teach? In your opinion, how motivated are they to teach? Can you elaborate?
6. How do you define the relationship between your students' TPACK and their motivation to teach? Do you think there is a relationship between their TPACK and their motivation to teach? If so, how do they relate to each other?

APPENDIX-H: Permission of Use for the Motivation to Teach Scale



Yilmaz Soylu, Meryem 21:16 (33 dakika önce)

Alıcı: ben

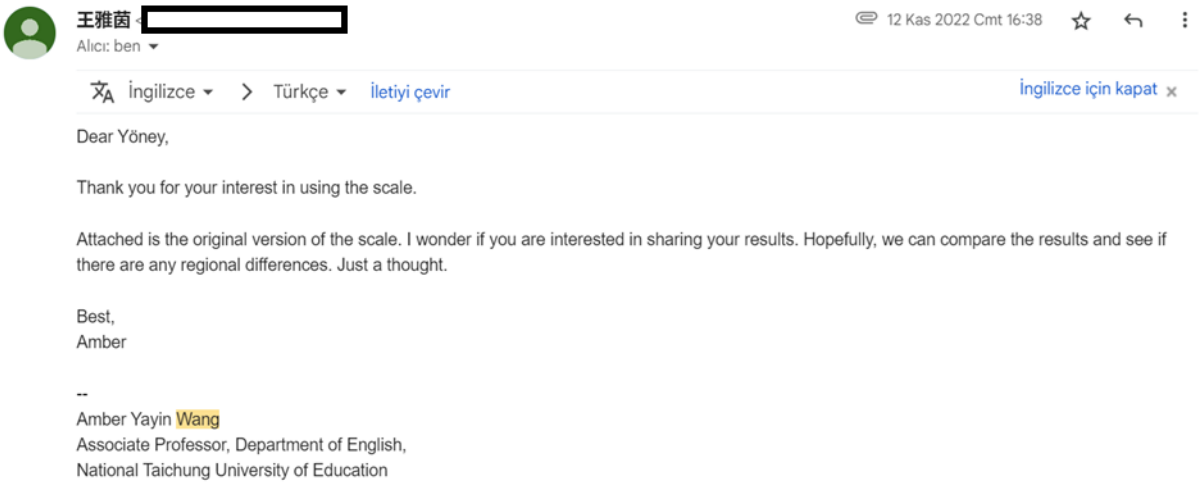
İngilizce > Türkçe İletiyi çevir İngilizce için kapat

Hi Reyyan Zulal,

Thanks for reaching out and letting me know.
Absolutely! Please consider this email as consent and feel free to use the Motivation to Teach Scale to collect data for your dissertation study, let me know if you have questions.

Kind regards,
Meryem

APPENDIX-I: Permission of Use for the EFL-TPACK Scale



王雅茵 [redacted]
Alıcı: ben
12 Kas 2022 Cmt 16:38

İngilizce > Türkçe İletiyi çevir İngilizce için kapat

Dear Yöney,

Thank you for your interest in using the scale.

Attached is the original version of the scale. I wonder if you are interested in sharing your results. Hopefully, we can compare the results and see if there are any regional differences. Just a thought.

Best,
Amber

--
Amber Yayin Wang
Associate Professor, Department of English,
National Taichung University of Education

APPENDIX-J: Ethics Committee Approval

Tarih: 16/11/2023 18:57
Sayı: E-66777842-300-00003203289
00003203289

T.C.
HACETTEPE ÜNİVERSİTESİ REKTÖRLÜĞÜ
Sosyal ve Beşeri Bilimler Araştırma Etik Kurulu

Sayı : E-66777842-300-00003203289 16/11/2023
Konu : Etik Kurulu İzni (Reyyan Zülal YÖNEY)

EĞİTİM BİLİMLERİ ENSTİTÜSÜ MÜDÜRLÜĞÜNE

İlgi : 25.10.2023 tarihli ve E-51944218-300-00003163773 sayılı yazınız.

Enstitünüz Yabancı Diller Eğitimi Ana Bilim Dalı İngiliz Dili Eğitimi Bilim Dalı Doktora Programı öğrencilerinden **Reyyan Zülal YÖNEY**'in **Prof. Dr. Elena ANTONOVA ÜNLÜ** danışmanlığında yürüttüğü *"Investigation of the Relationship Between Pre-Service EFL Teachers' Tpack and Teaching Motivation (İngilizce Öğretmeni Adaylarının Tpab ve Öğretme Motivasyonları Arasındaki İlişkinin İncelenmesi"* başlıklı tez çalışması Üniversitemiz Sosyal ve Beşeri Bilimler Araştırma Etik Kurulunun **14 Kasım 2023** tarihinde yapmış olduğu toplantıda incelenmiş olup, etik açıdan uygun bulunmuştur.

Bilgilerinizi ve gereğini rica ederim.

Prof. Dr. İsmet KOÇ
Kurul Başkanı

Bu belge güvenli elektronik imza ile imzalanmıştır.

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Telefon: Faks:
Kep:

Bilgi için: Burak CİHAN
Bilgisayar İşletmeni
Telefon: 03123051082

APPENDIX-K: Declaration of Ethical Conduct

I hereby declare that…

- I have prepared this thesis in accordance with the thesis writing guidelines of the Graduate School of Educational Sciences of Hacettepe University;
- all information and documents in the thesis/dissertation have been obtained in accordance with academic regulations;
- all audio visual and written information and results have been presented in compliance with scientific and ethical standards;
- in case of using other people's work, related studies have been cited in accordance with scientific and ethical standards;
- all cited studies have been fully and decently referenced and included in the list of References;
- I did not do any distortion and/or manipulation on the data set,
- and **NO** part of this work was presented as a part of any other thesis study at this or any other university.

12/12/2024

Reyyan Zülal Yöney

APPENDIX-L: Thesis/Dissertation Originality Report

12/12/2024

HACETTEPE UNIVERSITY
Graduate School of Educational Sciences
To The Department of Foreign Language Education

Thesis Title: Investigation of the Relationship Between Pre-Service EFL Teachers' TPACK and Teaching Motivation

The whole thesis that includes the *title page, introduction, main chapters, conclusions and bibliography section* is checked by using **Turnitin** plagiarism detection software take into the consideration requested filtering options. According to the originality report obtained data are as below.

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I declare that I have carefully read Hacettepe University Graduate School of Educational Sciences Guidelines for Obtaining and Using Thesis Originality Reports; that according to the maximum similarity index values specified in the Guidelines, my thesis does not include any form of plagiarism; that in any future detection of possible infringement of the regulations I accept all legal responsibility; and that all the information I have provided is correct to the best of my knowledge.

I respectfully submit this for approval.

Name Lastname:	Reyyan Zülal YÖNEY
Student No.:	N21147111
Department:	Foreign Language Education
Program:	English Language Teaching
Status:	☐ Masters ☒ Ph.D. ☐ Integrated Ph.D.

ADVISOR APPROVAL

APPROVED
Prof. Dr. İsmail Hakkı MİRİCİ

APPENDIX-M: Yayımlama ve Fikrî Mülkiyet Hakları Beyanı

Enstitü tarafından onaylanan lisansüstü tezimin/raporumun tamamını veya herhangi bir kısmını, basılı (kâğıt) ve elektronik formatta arşivleme ve aşağıda verilen koşullarla kullanıma açma iznini Hacettepe Üniversitesine verdiğimi bildiririm. Bu izinle Üniversiteye verilen kullanım hakları dışındaki tüm fikri mülkiyet haklarım bende kalacak, tezimin tamamının ya da bir bölümünün gelecekteki çalışmalarda (makale, kitap, lisans ve patent vb.) kullanım hakları bana ait olacaktır.

Tezin kendi orijinal çalışmam olduğunu, başkalarının haklarını ihlal etmediğimi ve tezimin tek yetkili sahibi olduğumu beyan ve taahhüt ederim. Tezimde yer alan telif hakkı bulunan ve sahiplerinden yazılı izin alınarak kullanılması zorunlu metinlerin yazılı izin alınarak kullandığımı ve istenildiğinde suretlerini Üniversiteye teslim etmeyi taahhüt ederim.

Yükseköğretim Kurulu tarafından yayınlanan **"Lisansüstü Tezlerin Elektronik Ortamda Toplanması, Düzenlenmesi ve Erişime Açılmasına ilişkin Yönerge"** kapsamında tezim aşağıda belirtilen koşullar haricince YÖK Ulusal Tez Merkezi / H.Ü. Kütüphaneleri Açık Erişim Sisteminde erişime açılır.

- Enstitü/ Fakülte yönetim kurulu kararı ile tezimin erişime açılması mezuniyet tarihinden itibaren 2 yıl ertelenmiştir. (1)
- Enstitü/Fakülte yönetim kurulunun gerekçeli kararı ile tezimin erişime açılması mezuniyet tarihimden itibaren … ay ertelenmiştir. (2)
- Tezimle ilgili gizlilik kararı verilmiştir. (3)

12 /12 /2024

Reyyan Zülal YÖNEY

"Lisansüstü Tezlerin Elektronik Ortamda Toplanması, Düzenlenmesi ve Erişime Açılmasına İlişkin Yönerge"

(1) Madde 6. 1. Lisansüstü tezle ilgili patent başvurusu yapılması veya patent alma sürecinin devam etmesi durumunda, tez danışmanının önerisi ve enstitü anabilim dalının uygun görüşü Üzerine enstitü veya fakülte yönetim kurulu iki yıl süreile tezin erişime açılmasının ertelenmesine karar verebilir.

(2) Madde 6. 2. Yeni teknik, materyal ve metotların kullanıldığı, henüz makaleye dönüşmemiş veya patent gibi yöntemlerle korunmamış ve internetten paylaşılması durumunda 3. şahıslara veya kurumlara haksız kazanç; imkânı oluşturabilecek bilgi ve bulguları içeren tezler hakkında tez danışmanın önerisi ve enstitü anabilim dalının uygun görüşü üzerine enstitü veya fakülte yönetim kurulunun gerekçeli kararı ile altı ayı aşmamak üzere tezin erişime açılması engellenebilir.

(3) Madde 7. 1. Ulusal çıkarları veya güvenliği ilgilendiren, emniyet, istihbarat, savunma ve güvenlik, sağlık vb. konulara ilişkin lisansüstü tezlerle ilgili gizlilik kararı, tezin yapıldığı kurum tarafından verilir. Kurum ve kuruluşlarla yapılan işbirliği protokolü çerçevesinde hazırlanan lisansüstü tezlere ilişkin gizlilik kararı ise, ilgili kurum ve kuruluşun önerisi ile enstitü veya fakültenin uygun görüşü Üzerine üniversite yönetim kurulu tarafından verilir. Gizlilik kararı verilen tezler Yükseköğretim Kuruluna bildirilir.*

Madde 7.2. Gizlilik kararı verilen tezler gizlilik süresince enstitü veya fakülte tarafından gizlilik kuralları çerçevesinde muhafaza edilir, gizlilik kararının kaldırılması halinde Tez Otomasyon Sistemine yüklenir

**Tez danışmanının önerisi ve enstitü anabilim dalının uygun görüşü üzerine enstitü veya fakülte yönetim kurulu tarafından karar verilir.*