THE RELATIONSHIP BETWEEN TEACHER EFFICACY AND TECHNOLOGICAL PEDAGOGICAL CONTENT KNOWLEDGE WITHIN THE SCOPE OF EFL PRE-SERVICE TEACHERS

Manolya TUNÇER

(M.A. THESIS)

Eskişehir 2014

THE RELATIONSHIP BETWEEN TEACHER EFFICACY AND TECHNOLOGICAL PEDAGOGICAL CONTENT KNOWLEDGE WITHIN THE SCOPE OF EFL PRE-SERVICE TEACHERS

MANOLYA TUNÇER

M.A. THESIS

Department of English Language Teaching

Advisor: Assoc. Prof. Dr. BELGİN AYDIN

Eskişehir
Anadolu University Institute of Educational Sciences
October 2014

TÜRK İNGİLİZCE ÖĞRETMEN ADAYLARININ TEKNOLOJİK PEDAGOJİK ALAN BİLGİLERİ İLE ÖĞRETMENLİK ÖZ YETERLİLİKLERİ ARASINDAKİ İLİŞKİ

MANOLYA TUNÇER

YÜKSEK LİSANS TEZİ

İngiliz Dili Eğitimi Anabilim Dalı

Danışman: Doç. Dr. BELGİN AYDIN

Eskişehir
Anadolu Üniversitesi Eğitim Bilimleri Enstitüsü
Ekim 2014

ABSTRACT

THE RELATIONSHIP BETWEEN TEACHER EFFICACY AND TECHNOLOGICAL PEDAGOGICAL CONTENT KNOWLEDGE WITHIN THE SCOPE OF EFL PRE-SERVICE TEACHERS

Manolya TUNÇER

English Language Teaching Program

Anadolu University Graduate School of Educational Sciences

October 2014

Advisor: Assoc. Prof. Dr. BELGİN AYDIN

The present study aimed to investigate (a) perceptions of Turkish EFL pre-service teachers related to their overall teacher efficacy and its three sub-scales: student engagement, classroom management, and instructional strategies; (b) level of their Technological Pedagogical Content Knowledge (TPACK); and, (c) the relationship between levels of teacher efficacy and TPACK of Turkish pre-service teachers of English language.

Involving the analysis of quantitative and qualitative data, “Data Triangulation” was employed in this study. The research was carried out in the contexts of English Language Teaching in Educational Faculties in Anadolu University, Marmara University, Yıldız Technical University, and Yeditepe University in 2013-2014 Spring Term. A total of 110 fourth-year students in these universities responded to all of the questions in the instruments. Data were collected through 3 main instruments: (1) English Teachers’ Sense of Efficacy Scale to gather information related to their understanding of their efficacy levels (Chacon, 2005); (2) TPACK-Deep Scale for gaining information about

combining technology, pedagogy, and content knowledge in the ways of both learning and teaching processes (Kabakçı-Yurdakul, Odabaşı, Kılıçer, Çoklar, Birinci, and Kurt in 2012); and (3) Open-ended questions to assess their self-report of how efficaciously they integrate and use technology in their teaching experiences during the last part of their undergraduate studies. Additionally, “Teacher’s Background Information” part was also used in order to detect the participants’ technology use in English language teaching in a more detailed way. Quantitative data were analysed by descriptive statistics including frequency, percentage, mean and standard deviation, correlation analysis, and bivariate regression methods; and, qualitative data were analysed with constant comparison method.

The findings of the analysis of descriptive statistics indicated high levels of teacher efficacy beliefs of the Turkish EFL pre-service teachers. Additionally, the participants reported to have high levels of TPACK. Furthermore, correlation analysis demonstrated a meaningful relationship between overall teacher efficacy and TPACK competence. As for the further analysis, the results of regression analysis showed that TPACK has an influence on all three sub-scales of teacher efficacy which are “Student Engagement”, “Classroom Management”, and “Instructional Strategies”. The results of the open-ended questions also supported the relationship between TPACK and teacher efficacy. Thus, quantitative data results were supported with qualitative data.

As it was carried out to reveal the relationship between teacher efficacy and TPACK for the first time, this study proved to have valuable contributions in order to improve training process of Turkish EFL pre-service teachers. At the end of the study, there are some implications for educators and educational researchers.

ÖZET

TÜRK İNGİLİZCE ÖĞRETMEN ADAYLARININ TEKNOLOJİK PEDAGOJİK ALAN BİLGİLERİ İLE ÖĞRETMENLİK ÖZ YETERLİLİKLERİ ARASINDAKİ İLİŞKİ

Manolya TUNÇER

İngiliz Dili Eğitimi Anabilim Dalı

Anadolu Üniversitesi Eğitim Bilimleri Enstitüsü

Ekim 2014

Danışman: Doç. Dr. BELGİN AYDIN

Bu çalışmada, (a) Türk İngilizce öğretmen adaylarının öğretmen öz yeterliliğine ve onun üç boyutuna -“Öğrenci Katılımını Sağlama”, “Sınıf Yönetimi” ve “Öğretim Stratejilerini Kullanma”- yönelik algılarının, (b) Teknolojik Pedagojik Alan Bilgisi düzeylerinin ve (c) öğretmen öz yeterlilik düzeyleri ile Teknolojik Pedagojik Alan Bilgisi düzeyleri arasındaki ilişkinin araştırılması hedeflenmiştir.

Hem nicel hem de nitel verileri kapsayan bu çalışmada, “Veri Çeşitlemesi” yöntemi kullanılmıştır. Araştırma, 2013-2014 Eğitim Öğretim Yılı Bahar Dönemi’nde, Anadolu, Marmara, Yıldız Teknik ve Yeditepe Üniversiteleri’nin Eğitim Fakültesi İngilizce Öğretmenliği Bölümleri’nde gerçekleştirilmiştir. Bu üniversitelerde okuyan 110 son sınıf öğrencisi veri toplama aracında yer alan soruların tamamına cevap vermiştir. Veriler, İngilizce Öğretmenleri’nin Öz Yeterlik İnancı Ölçeği (ETSES) (Chacon, 2005), Teknolojik Pedagojik Eğitim Yeterlilik Ölçeği (TPACK-Deep) (Kabakçı-Yurdakul, Odabaşı, Kılıçer, Çoklar, Birinci ve Kurt, 2012) ve teknolojiyi öğretmenlik deneyimlerinde ne kadar etkin bir biçimde kullandıklarına yönelik açık uçlu sorular kullanılarak katılımcıların lisans eğitimlerinin sonunda toplanmıştır. Bunun yanında, “Öğretmen Bilgileri” bölümü yer almaktadır ve bu bölüm katılımcıların İngilizce öğretiminde teknoloji kullanımlarını daha detaylı ortaya çıkarmak için kullanılmıştır. Nicel veriler, sıklık/frekans, yüzdelik, ortalama ve standart sapmayı içeren betimleyici istatistik; korelasyon analizi ve iki değişkenli regresyon metotları ile incelenmiştir; nitel veriler ise Sabit Karşılaştırma Yöntemi ile analiz edilmiştir.

Betimleyici istatistik analiz sonuçları, çalışmaya katılan Türk İngilizce öğretmen adaylarının yüksek düzeyde yeterlilik algı düzeyine sahip olduğunu göstermiştir. Bununla birlikte, katılımcılar yüksek düzeyde Teknolojik Pedagojik Alan Bilgisine sahip olduklarını belirtmişlerdir. Korelasyon analizi bulguları ise İngilizce öğretmen adaylarının öz yeterlilik algı düzeyleri ile Teknolojik Pedagojik Alan Bilgi düzeyleri arasında anlamlı bir ilişki olduğunu göstermektedir. Regresyon analizi sonuçları da Teknolojik Pedagojik Alan Bilgisinin öğretmen yeterliliklerinin üç boyutunun “Öğrenci Katılımını Sağlama”, “Sınıf Yönetimi” ve “Öğretim Stratejilerini Kullanma” tamamı üzerinde etkiye sahip olduğu ortaya çıkmıştır. Açık uçlu yanıtlara verilen cevaplar da bu sonuçları desteklemektedir. Böylece, nicel veri sonuçları nitel verilerle desteklenmiştir.

İngilizce’ nin yabancı dil olarak kullanıldığı Türkiye’de, öğretmen adaylarının öğretmen öz yeterlilikleri ile Teknolojik Pedagojik Alan Bilgileri arasındaki ilişkinin ilk kez araştırıldığı bu çalışmada, Türk İngilizce öğretmen adaylarının yetişme süreçlerinin iyileştirilmesi adına önemli katkılarda bulunmaktadır. Çalışmanın sonunda, eğitmenlere ve eğitim bilimlerine yönelik araştırma yapanlara yönelik öneriler bulunmaktadır.

JÜRİ VE ENSTİTÜ ONAYI

Manolya TUNÇER'in "The Relationship Between Teacher Efficacy and Technological Pedagogical Content Knowledge Within the Scope of EFL Pre-Service Teachers " başlıklı tezi 23.10.2014 tarihinde, aşağıda belirtilen jüri üyeleri tarafından Anadolu Üniversitesi Lisansüstü Eğitim-Öğretim ve Sınav Yönetmeliğinin ilgili maddeleri uyarınca Yabancı Diller Eğitimi Anabilim Dalı İngilizce Öğretmenliği programı yüksek lisans tezi olarak değerlendirilerek kabul edilmiştir.

	Adı-Soyadı	**İmza**
Üye (Tez Danışmanı)	: Doç.Dr.Belgin AYDIN	....
Üye	: Prof.Dr. Zülal BALPINAR	....
Üye	: Doç.Dr. Işıl KABAKÇI YURDAKUL	....
Üye	: Yard.Doç.Dr. Gonca SUBAŞI	....
Üye	: Yard.Doç.Dr. Özgür YILDIRIM	....

Prof.Dr. Esra CEYHAN
Anadolu Üniversitesi
Eğitim Bilimleri Enstitü Müdürü

ACKNOWLEDGEMENTS

I dedicate this thesis to my precious nephew,

Yusuf Ege Helvacıoğlu

I would like to sincerely acknowledge all the people who have assisted me since the very beginning of this study. However, I would especially like to thank the following individuals.

I would not have been able to complete my graduate studies without the endless help and professional guidance of my advisor, Assoc. Prof. Dr. Belgin Aydın. She was always there to inspire, motivate, guide, and help me when faced with challenges throughout my graduate work. I deeply appreciate her support and understanding throughout the long process of writing my thesis. I am immensely grateful for all that you have done for me!

I would also like to express my sincere appreciation to my committee members for their time and recommendations. Prof. Dr. Zülal Balpınar contributed to my academic development, and my thesis. Moreover, I developed a profound interest in my thesis topic after reading Assoc. Prof. Dr. Işıl Kabakçı Yurdakul's study. Dr. Kabakçı Yurdakul also provided invaluable advice regarding my thesis. Furthermore, I must acknowledge Assist. Prof. Dr. Özgür Yıldırım for guiding me in the process of data analysis and other suggestions for this study. Last but not least, Assist. Prof. Dr. Gonca Subaşı put forward important recommendations for literature, methodology, and data analysis procedure. Thank you so much for all the insightful comments, constructive criticism and guidance!

Special thanks must be given to my invaluable friends, Zeynep Çetin and Aylin Sevimel, who supported me throughout this long journey. Their constant support and companionship made this achievement more enjoyable.

I am thankful to my colleagues Ece Genç, Esra Çakmak, and Ramazan Şamil Tatık who helped me during the data collection process.

Finally, my deepest gratitude goes to my loving parents Nilgün and Yusuf Tunçer, and to my sister Assist. Prof. Dr. Ender Helvacıoğlu and brother-in-law Emre Helvacıoğlu, who have always believed in me and encouraged me to run after all of my aspirations.

TABLE OF CONTENTS

ABSTRACT.. iii

ÖZET... v

JÜRİ VE ENSTİTÜ ONAYI.. vii

ACKNOWLEDGEMENTS.. viii

TABLE OF CONTENTS ix

LIST OF TABLES……………………………………..……………. xiii

LIST OF FIGURES ...…………………………………………..……. xiv

LIST OF GRAPHS xv

LIST OF ABBREVIATIONS……………………………..…....… xvi

CHAPTER 1: INTRODUCTION ……………………………….......... 1

1.1. Background of the Study.. 1

1.2. Statement of the Problem.. 4

1.3. The Purpose of the Study 6

1.4. The Research Questions of the Study 6

1.5. Significance of the Study 6

1.6. Definitions of Terms 8

CHAPTER 2. REVIEW OF LITERATURE 9

2.1. Teacher Efficacy 9

2.1.1. The concept and development of self-efficacy................... 9

2.1.2. The concept of teacher efficacy...................................... 10

2.2. Rotter’s Social Learning Theory Efficacy 10

2.3. Bandura’s Social Cognitive Theory 11

2.4. Sources of Self-Efficacy 13

2.4.1. Enactive mastery experiences 13

2.4.2. Vicarious experiences 14

2.4.3. Verbal persuasion 14
2.4.4. Physiological and affective states 15
2.5. Integrated Model 15
2.6. Measurement of Teacher Efficacy 17
2.7. Studies on Teacher Efficacy in EFL/ESL Contexts 20
2.8. Studies on Teacher Efficacy in Language Teaching in Turkey....... 21
2.9. Introducing Technological Pedagogical Content Knowledge (TPACK) Framework 25
2.10. Development of TPACK 27
2.11. The TPACK Model 29
2.11.1. Content knowledge 31
2.11.2. Pedagogical knowledge 31
2.11.3. Pedagogical content knowledge 32
2.11.4. Technology knowledge 32
2.11.5. Technological content knowledge 33
2.11.6. Technological pedagogical knowledge 33
2.12. Evaluation of TPACK Model 34
2.13. Studies on TPACK in Various Contexts 36
2.14. Summary 40

CHAPTER 3. METHODOLOGY 41
3.1. Introduction 41
3.2. Participants and Settings 41
3.3. Research Tools 43
3.3.1. English Teachers' Sense of Efficacy Scale (ETSES) 44
3.3.2. TPACK-Deep Scale 44
3.3.3. Open-ended questions 45
3.4. Data Collection Procedures 46

3.5. Analytical Procedures 47
3.6. Summary 49

CHAPTER 4. RESULTS AND DISCUSSION.. 50
4.1. Introduction 50
4.2. Reliability of ETSES and TPACK-Deep Scale 50
4.3. Findings Related to the Research Questions 51
4.3.1. Levels of Turkish EFL pre-service teachers' perceptions of teacher efficacy 51
4.3.1.1. The EFL pre-service teachers' perceptions of teacher efficacy levels for "Student Engagement", "Classroom Management", and " Instructional Strategies" 53
4.3.2. Levels of Turkish EFL pre-service teachers' perceptions of TPACK competences 54
4.3.3. Relationship between Turkish EFL pre-service teachers' perceptions of overall teacher efficacy and its sub-scales, and TPACK competences 58
4.4. Discussion 66
4.5. Summary 73

CHAPTER 5. CONCLUSIONS AND IMPLICATIONS 76
5.1. Summary 76
5.2. Conclusions 78
5.3. Implications 80
5.4. Suggestions for Further Research 82

APPENDICES 84

REFERENCES 106

LIST OF TABLES

Table 1. Distribution of Participants related to the Universities....................... 42

Table 2. Outline of the Research Questions, Related Instruments and Data Analysis.. 49

Table 3. Mean Score and Standard Deviation of Overall ETSES...................... 51

Table 4. Mean Scores and Standard Deviations of ETSES Scale (For Sub-scales) 53

Table 5. Mean Score and Standard Deviation of Overall TPACK-Deep 54

Table 6. Inter-correlations between the participants' perceptions of teacher efficacy and TPACK competences 59

Table 7. Regression Analysis (Dependent Variable: ETSES) 59

Table 8. Inter-correlations between the Participants' Perceptions of TPACK Competences and Sub-Scales of Teacher Efficacy 60

Table 9. Regression Analysis (Dependent Variable: Student Engagement) 61

Table 10. Regression Analysis (Dependent Variable: Classroom Management) 63

Table 11. Regression Analysis (Dependent Variable: Instructional Strategies) 64

Table 12. Results of Qualitative Data Analysis..74

LIST OF FIGURES

Figure 1. The relationship among the elements in Triadic Reciprocal Causation. P symbolizes internal personal factors, B behaviour, and E external environment (Bandura, 1997, p.6) 12

Figure 2. Diagrammatic representation of the difference between efficacy expectations and outcome expectations (Bandura, 1977, p. 193) 13

Figure 3. The cyclical nature of teacher efficacy (Tschannen-Moran, Woolfolk Hoy, and Hoy, 1998, p.228) 17

Figure 4. Relationship among content, pedagogy and technological knowledge (Pierson, 2001, p.427) 27

Figure 5. TPCK model and its fundamental components (Mishra and Koehler, 2008, p.12) 30

LIST OF GRAPHS

Graph 1. Distribution of the Pre-service Teachers' Efficacy Scores 52
Graph 2. Distribution of the Pre-service Teachers' TPACK Scores 55
Graph 3. Technology Use for Various Language Skills 56
Graph 4. Reasons for Technology Use during the Lesson Preparation 57
Graph 5. Future Plans for Using Technology in English Language Teaching .. 58

LIST OF ABBREVIATIONS

TE	: Teacher Efficacy
TPACK	: Technological Pedagogical Content Knowledge
RAND	: Research and Development
GTE	: General Teaching Efficacy
PTE	: Personal Teaching Efficacy
TLC	: Teacher Locus of Control
TSES	: Teacher Sense of Efficacy Scale
ETSES	: English Teacher Sense of Efficacy Scale
EFL	: English as a Foreign Language
ESL	: English as a Second Language
CK	: Content Knowledge
PK	: Pedagogical Knowledge
PCK	: Pedagogical Content Knowledge
TK	: Technology Knowledge
TCK	: Technological Content Knowledge
TPK	: Technological Pedagogical Knowledge

CHAPTER 1

INTRODUCTION

1.1.Background of the Study

The developments of science and technology have continuously had an effect on our world. In the 21st century, people need to have the skills and intelligence, to think critically, find solutions to problems, work together with other people using different technological tools in learning environment (Angeli&Valenides, 2009).

Learning environments are complex and dynamic surroundings requiring the efficient integration of content and pedagogy in order to meet learning needs of both students and teachers. There have been many arrangements made in both daily activities and activities at school with recent developments in technology and science. Teachers in the present educational climate are expected to teach subject matter to a larger group of students and address with their social, emotional, and educational problems more as compared to the past (Lohman, 2000).

There is an important view that teachers' knowledge and abilities does not always assure effective teaching, and teachers' judgement related to their abilities becomes a crucial element at this point (Bandura, 1997). Tschannen-Moran, Woolfolk Hoy, and Hoy (1998) explained the term "teacher efficacy" referring to the teachers' beliefs about their abilities to perform successfully in a particular teaching task. Pajares (1992) claimed that the relationship among teacher practices, teacher knowledge, and student outcomes and their beliefs can be understood properly with the investigation of their educational beliefs. Another strong relationship was detected among teachers' sense of self-efficacy and plans, decisions, and practices related to education (Pajares, 1996).

Teacher efficacy was investigated in related literature in terms of its relationship with various variables. Many studies were carried out investigate teacher efficacy in relation to different demographic and contextual factors. The results of those studies revealed that teachers having higher efficacy were more enthusiastic about implementing new approaches (Ghaith and Yaghi, 1997); and had less negative ideas related to learners (Tournaki and Podell, 2005). Some factors such as age, gender, and teaching experience (Mede, 2009); and, sense of community were also identified as having an effect on teacher self-efficacy (Lee, Dedrick and Smith, 1991).

The issue of efficacy beliefs of pre-service teachers arouse a great interest in the related research environment. Hoy (2000) explained the reason of this influencing teachers' sense of efficacy during the pre-service teaching period. Once beliefs are formed, it is much more difficult to change them. Various studies were conducted on the perceptions of pre-service teacher efficacy in various fields in Turkey: in science Savran and Çakıroğlu (2003), Sarıkaya (2004), Gencer and Çakıroğlu (2007), Aydın and Boz (2010), and Yalçın (2011); in biology Savran and Çakıroğlu (2001), and in chemistry Akkuzu and Akçay (2012). The perceptions of EFL pre-service teachers and the effect of these perceptions received attention of the researchers (Göker, 2006; Atay, 2007; Pekkanli-Egel, 2009; Alcı and Yüksel, 2012). Relationship with student engagement, classroom management, and instructional strategies (Atay, 2007), some other variables such as teaching practicum and peer coaching (Göker, 2006), role of mentors (Pekkanli-Egel, 2009), and metacognitive awareness (Alcı and Yüksel, 2012) in relation to teachers' perceptions were among the interest of recent researchers. One of those researchers, Atay (2007) proposed that formative training process of teacher education programs is more appropriate for influencing the change as compared to classroom. Thus, pre-service teacher education period is vital for the development of teacher efficacy perceptions.

Although various elements were found to have influence on pre-service teacher' efficacy perceptions, TPACK has not been investigated in EFL context as a factor which was studied in other departments (Niess, 2005; Sahin, Akturk, and Schmidt, 2009; Erdogan and Sahin, 2010; Abbitt, 2011). Technological Pedagogical Content Knowledge (TPACK) is a new model explained by Koehler and Mishra (2008) as the knowledge of various technological tools and how to use them in a specific subject area. This is a conceptual framework necessary for teachers to integrate technology in their branches efficaciously. This model has three major components: content, pedagogy and technology. According to TPACK, each fundamental component has both its own individual meaning and another one with the combination of the others. A creative and dynamic balance among these components is required constantly in order to teach successfully with using technology (Angeli and Valanides, 2005).

The integration of technology into education can be explained as using available tools and materials in order to facilitate learning environment (Okojie, Olinzock, and Okojie-Boulder, 2006). Integrating technology effectively comprises the necessary technology, curriculum, pedagogy, abilities of teachers, and organizational and economical preparedness (Tinio, 2003). However, it is not easy to teach using technology (Rittel and Webber, 1973). It has a multidimensional and complex nature as explained by Koehler and Mishra (2009):

> There is no single technological solution that applies for every teacher, every course, or every view of teaching. Rather, solutions lie in the ability of a teacher to flexibly navigate the spaces defined by the three elements of content, pedagogy, and technology and the complex interactions among these elements in specific contexts (p. 66).

There have been various studies about technology integration in education. Evaluating what students know and are able to do in different courses in the U.S., the National Assessment of Educational Progress (NAEP) prepared a report about the availability and use of technology in education. The outcomes demonstrated that computer use by both teachers and students in the period of instruction was stated as “often” (40%) or “sometimes” (29%). Additionally, the most popular programs used by the teachers with administrative or instructional aims are *“word processing software”* (96%), “*Internet”* (94%), *“software for managing student records*” (80%), *“software for making presentations”* (63%), and *“spreadsheets and graphing programs”* (61%) (Gray, Thomas, and Lewis, 2010). Furthermore, the International Society for Technology in Education emphasized the integration of technology in education with adding a subtitle of "*technology operations and concepts*" as a set of standards and performance indicators for teachers (ISTE, 2000).

TPACK is one of the most comprehensive models related to technology integration in education. In a study conducted by the Turkish Education Association (Türk Eğitim Derneği-TED), Technological Pedagogical Content Knowledge (TPACK) was explained as "having knowledge about the integration of technology with curriculum and subject area, how to teach it and its' relationship with the other disciplines recent developments in the subject area, its basic concepts, instruments, structures and content" (TED, 2009, pp. xix-xx). Furthermore, in the same study of Turkish Education Association, Technological Pedagogical Content Knowledge (TPACK) was emphasized as a qualification that teachers should have for being successful in their profession.

Recent studies one the preparation period of teaching profession focus on the relationship between TPACK and teacher efficacy beliefs (Niess, 2005; Sahin, Akturk, and Schmidt, 2009; Erdogan and Sahin, 2010; and Abbitt, 2011). According to Bandura's theory of self-efficacy, efficacy beliefs of teachers is an important issue for pre-service teacher depending on its nature of being easily affected and changed most during the first years of teaching (Hoy, 2000). Furthermore, Ashton (1984) argued that teacher education programs designed to develop efficacy beliefs of pre-service teachers should strive for the training of teachers having high level of motivation and confidence for powerful classroom performance. From this point of view, Ashton also asserted that teacher education programs require consisting of authentic and context-based teaching (as cited in Wan, 2005).

1.2.Statement of the Problem

Van Olphen (2008) emphasized that a change occurring in one of the basic elements of Mishra and Koehler's TPACK model would probably cause variations in other elements in order to sustain a state of balance. If teachers did not apply technological tools for the practice of a particular subject matter appropriately, they would present the content in another way (Koehler and Mishra, 2008). Correspondingly, the adjustment would also lead to some pedagogical modifications, as well. Moreover, Shreiter and Ammon (1989) asserted that adoption of instructional practices by teachers involves a procedure of assimilation and accommodation leading to variation in teachers' ideas (as cited in Niess, 2005). According to Niess (2005), this referred to the needs for maintaining a variety of experiences in teacher education programs. Although learners and the process of learning have been at the centre of studies related to technology use in language learning, a deep contemplation about development of teacher candidates has not been made for the integration of technology into teaching practices (Koehler and Mishra, 2008).

Investigating the possibility of changes in efficacy beliefs in language teaching, Woolfolk Hoy and Burke-Spero (2005) explain that student teachers' perception of self-efficacy increases in the period of teacher education program. Furthermore, Woolfolk Hoy (2000), Woolfolk Hoy and Burke-Spero (2005) assert that teacher efficacy beliefs are opposing to change to a certain degree when they are accepted. Thus, various researchers have carried out studies related to efficacy beliefs of pre-service teachers and found several variables having influence on the pre-service teachers' efficacy perceptions such as perceptions of language teaching (Liaw, 2004) mentor's behaviour (Pekkanli-Egel, 2009), and metacognition (Alcı and Yüksel, 2012).

There are some studies on the relationship between TPACK and teacher efficacy (Niess, 2005; Sahin, Akturk, and Schmidt, 2009; Erdogan and Sahin, 2010; and Abbitt, 2011). However, to the knowledge of the researcher, no study has been found related to the relationship among Turkish EFL pre-service teachers' efficacy beliefs and their TPACK knowledge. Thus, the scope of research on pre-service teachers' efficacy should be broadened, and the effect of technology integration on the beliefs of pre-service teachers' efficacy in English language teaching profession should be investigated in Turkish contexts.

1.3.The Purpose of the Study

The present study aims to investigate (a) perceptions of Turkish EFL pre-service teachers related to their overall teacher efficacy and its three sub-scales: students engagement, classroom management, and instructional strategies; (b) level of their Technological Pedagogical Content Knowledge (TPACK); and, (c) the relationship between levels of teacher efficacy and TPACK of Turkish pre-service teachers of English language.

1.4.The Research Questions of the Study

This study addresses the following questions in order to reveal the variances in teacher efficacy beliefs into language education reported by Turkish pre-service EFL students from different universities, taking into consideration TPACK:

1. What are the levels of Turkish EFL pre-service teachers' perceptions of overall teacher efficacy and its sub-scales- (a) students engagement, (b) classroom management, and (c) instructional strategies?
2. What are the levels of Turkish EFL pre-service teachers' perceptions of TPACK competences?
3. What is the relationship between Turkish EFL pre-service teachers' perceptions of TPACK competences and overall teacher efficacy, and its sub-scales?

1.5.Significance of the Study

It is possible to observe the effects of technology in almost all parts of language education in the 21^{st} century. Students spend large amounts of time after school using technological tools such as mobile phones, computers, and so on. Technology should not be thought as an independent unit, but it should be seen as an essential segment of instructional delivery in order to improve students' learning experiences. Teachers should consider the suitability of technological tools in terms of the goals of the lesson, methods of instruction, and assessment (Okojie, Olinzock, and Okojie-Boulder, 2006). Thus, becoming a substantial element of students' life, these tools provide a big opportunity for educators. At this point, TPACK has a crucial role in teaching content and pedagogy with technology.

One of the aims of the current study is to find out the pre-service teachers' levels of TAPCK. These results will show the pre-service teachers' TPACK levels. It is crucial for education planners and managers to detect their levels and make arrangements required in order to improve these levels because teaching profession requires combining content, pedagogy, and technology in an efficient way in the modern world. Thus, it would be a good idea for education planners and managers to know their current TPACK levels and find ways to develop these three components together for the purpose of preparing teachers candidates for their professional career.

In the current study, the relationship between EFL teachers' perceptions of TPACK competences and teacher efficacy will be examined because TPACK is seen as one of the potential factors playing role in the development of teacher efficacy in language education. Developing their TPACK with the provision of an education integrating technology, content, and pedagogy will probably increase their teacher efficacy. Hence, language teachers will be more efficacious; as a result, language education will also be more effective.

The present study will broaden our knowledge on TPACK and its relation to teacher efficacy in Turkish contexts suggesting valuable information about the candidates' perceptions about their own competences in English Language Teaching. This study will also reveal the frequency of teacher candidates' use of technology in language teaching, and their plans for future teaching in order to understand the role of technology better for their preparedness in English Language Teaching.

1.6.Definitions of Terms

Self-efficacy refers to beliefs in a person’s capabilities to arrange and carry out an action necessary to achieve the determined objectives (Bandura, 1997, p.3).

Teacher efficacy is the teacher’s belief in his or her capability to organize and execute courses of action required to successfully accomplish a specific teaching task in a particular context (Tschannen-Moran, Woolfolk Hoy and Hoy, 1998, p. 233).

Pre-service teacher refers an education major at the university or college level in preparation for employment (Harris and Hodges, 1995, p.193).

Technological Pedagogical Content Knowledge (TPACK) is explained as “how teachers’ understanding of technologies and pedagogical content interact with one another to produce effective teaching with technology” (Koehler & Mishra, 2008, p. 12).

CHAPTER 2

REVIEW OF LITERATURE

In this chapter, related literature will be reviewed in two main parts. The first part explores the literature on Teacher Efficacy, and the second part records the details of Technological Pedagogical Content Knowledge (TPACK).

2.1. Teacher Efficacy

Teacher efficacy refers to teachers' beliefs or decisions regarding their own abilities or qualities to produce expected results in learning and student engagement (Armor, Conry-Oseguera, Cox, King, McDonnell, Pascal, Pauly and Zellman, 1976; and Bandura, 1977). Teacher efficacy encompasses profound impacts and crucial suggestions for various points such as students' success and aims of teaching. It is possible to observe the effect of efficacy beliefs on perseverance and flexibility of teachers in especially difficult situations. Teachers with stronger beliefs of efficacy are more receptive to new ideas for the purpose of meeting the learners' need in a better way (Tschannen-Moran and Woolfolk Hoy, 2001).

2.1.1. The concept and development of self-efficacy

Self-efficacy is defined as beliefs that people hold about their abilities to produce performance in determined levels. These beliefs have an effect on our lives by controlling and affecting our thoughts, feelings, motivation, and behaviours (Bandura, 1994). According to Pajares (1997), people's beliefs about their competences have a strong effect on how they behave. These beliefs help to figure out what people do with their competences and knowledge. In particular, beliefs of self-efficacy have an important role to ascertain to what degree they acquire abilities and knowledge at the beginning (Pajares, 1997).

"Teacher Self-Efficacy" is a related term to self-efficacy explained by Tschannen-Moran, Woolfolk Hoy, and Hoy (1998) as "the teacher's belief in his or her capability to organize and execute courses of action required to successfully accomplish a specific teaching task in a particular context" (p. 233).

According to Bandura (1997), designing a learning environment for the purpose of improvement cognitive competences is dependent on both teachers' abilities and self-efficacy.

2.1.2. The concept of teacher efficacy

There have been a variety of definitions of teacher efficacy. In the early studies, Berman, McLaughin, Bass, Pauly, and Zellman (1977) explained that teachers' beliefs on their ability have an influence on students' learning to the certain degrees. Guskey and Passaro (1994) defined teacher efficacy as teachers' beliefs and opinions are the extent they are able to affect learning of students including the ones who are difficult and unmotivated. Additionally, Gibbs (2003) expressed that self-efficacy is a strong predictor for determining the way that teachers will act.

The current definition of teacher efficacy is "the teacher's belief in his or her capability to organize and execute courses of action required to successfully accomplish a specific teaching task in a particular context" (Tschannen-Moran, Woolfolk Hoy & Hoy, 1998, p. 233). The next part will shed light on the conceptual basis and theoretical background of contemporary understanding of teacher efficacy and the tools that are used in order to make the construct clear and develop the assessment in terms of psychological views with which teacher efficacy is associated (Tschannen-Moran, Woolfolk and Hoy, 1998).

2.2. Rotter's Social Learning Theory

The first studies conducted in relation to teacher efficacy were based on Rotter's Social Learning Theory. According to Rotter's Social Learning Theory, teacher efficacy is the degree to which teachers consider that they have the power to control the reinforcements of their actions. It investigates whether the environment can have an influence on the control of events. Thus, the main points of teacher efficacy research are to examine how students' motivation and performances are affected by the factor of teachers' perception on environmental elements, and to what extent their beliefs deal with negative sides of these elements.

Rotter's Social Leaning Theory comprises the base for the early phase of efficacy studies. Grounded in this theory, researchers in the Research and Development (RAND) organization carried out a variety of studies. One of these studies was conducted by Armor, Conry-Oseguera, Cox, King, McDonnell, Pascal, Pauly and Zellman (1976) which revealed that teachers' sense of efficacy is a crucial factor that improves students' success in reading.

2.3. Bandura's Social Cognitive Theory

According to Social Learning Theory, observing people, their behaviors and outcomes can be seen as a way to learn for the other people. Social Cognitive Theory broadens this view of Social Learning Theory by taking cognitive factors into consideration such as beliefs and expectations (Woolfolk, 2007). Bandura's Social Cognitive Theory is the second base for efficacy studies. There are three basic elements of the theory: human agency, outcome expectancy and efficacy belief.

Bandura (1997) made clear the meaning of "agency" as the actions that are performed deliberately. Personal efficacy beliefs comprise the crucial element of human agency. People who do not believe in their power to achieve something do not make an effort to realize it. A sense of personal efficacy can be described as propositional beliefs explained by Social Cognitive Theory (Bandura, 1997).

Human agency acts within a structure. The structure consists of the parts that depend on one another, and this entails Triadic Reciprocal Causation. In this respect, internal personal factors are cognitive, affective and biological events, behavior, and external environment. All these factors have an impact on each other in dual ways as it can be seen in Figure 1 (Bandura, 1997).

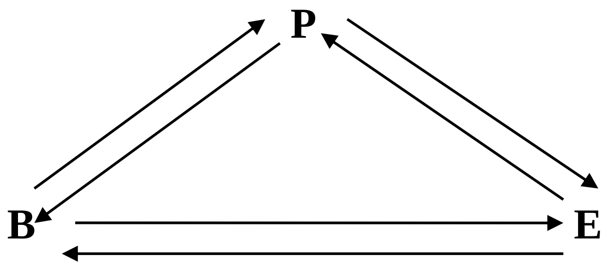


Figure 1. *The relationship among the elements in Triadic Reciprocal Causation. P symbolizes internal personal factors, B behaviour, and E external environment* (Bandura, 1997, p.6)

As Bandura (1989) explained, people are product formed by both their inner forces and the environment. Only one cannot determine people’s decision. While our environment affects the way we act, we also affect our environment by our actions. People are not only the outcomes of the environment but also the creator of their social environment because agency is based on social areas and acts within socio-structural systems (Bandura, 1997).

Outcomes are the results of particular situations. The way in which people behave mostly establishes the outcomes of their experiences (Bandura, 1997). The second element of the theory, outcome expectancy is explained as the guess made by a person related to particular behaviours that probably cause certain outcomes (Bandura, 1977).

As the last element of Social Cognitive Theory, self-efficacy is defined as “the beliefs in one’s capabilities to organize and execute the course of action required to produce given attainments” (Bandura, 1997, p.3). The difference between “outcome expectations” and “efficacy expectations” is illustrated in Figure 2.

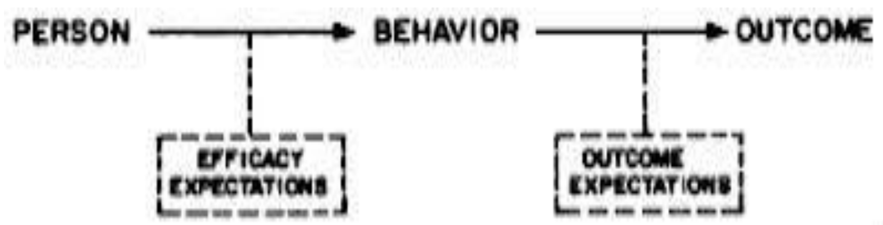


Figure 2. *Diagrammatic representation of the difference between efficacy expectations and outcome expectations* (Bandura, 1977, p. 193)

As Bandura (1977) expressed, outcome expectations are defined as a person's beliefs related to behaviour that has particular outcomes in the end. People consider that there are some possible outcomes of the actions conducted in certain ways. However, it does not have any impact on the behaviour provided that people have suspicions about the successful achievement (Bandura, 1977). Having doubts about their competences in controlling actions, people are likely to undermine their power in particular situations (Bandura, 1982).

Bandura (1997) defined another related term "perceived self-efficacy" which is people's belief related to their abilities of organizing and carrying out different tasks in order to reach their objectives. According to Bodzin (1999), there is an impact of perceived self-efficacy on personal preferences. People are willing to take part in the activities that they believe in handling successfully. However, they have a tendency to stay away from threatening situations depending on their personal beliefs (Bodzin, 1999).

2.4. Sources of Self-Efficacy

According to Bandura (1977, 1997), there are four major sources of information depending on expectation and personal efficacy: enactive mastery experiences, vicarious experiences, verbal persuasion, and physiological and affective states. The following part will shed light on these sources.

2.4.1. Enactive mastery experiences

Enactive mastery experiences are an important source of efficacy; in fact, Bandura (1997) emphasized that enactive mastery experiences are the most powerful source of efficacy. As Bandura expressed, achievements that people have had increase mastery expectations; on the contrary, their lack of success repeatedly reduces them. Failures may have a negative effect which decreases the development of strong efficacy expectations as a consequence of repeated achievements (Bandura, 1977). Put in a plain way, Pajares (1997) explained that people evaluate the impact of their actions, and their judgements help to form their efficacy beliefs. Results that are commented as “success” increase self-efficacy, but the outcomes evaluated as “failure” decrease it (Pajares, 1997).

2.4.2. Vicarious experiences

Observing the performance of others causes people believe that they can also achieve the same thing to a certain extent. There is tendency to rely upon vicarious experiences less as compared to the direct information concerning the achievement of people because it is seen as the interpretation of social behaviours (Bandura, 1977). According to Pajares (1997), this is not such a strong source as mastery experience, but people can be sometimes susceptible to vicarious experience especially at the time of having doubts about their competences or restricted experiences in their past.

2.4.3. Verbal persuasion

According to Bandura (1977), people convince themselves that they can deal with a situation successfully that caused them difficulty in the past. People who have the abilities for specific tasks and are verbally persuaded will probably put effort and keep up with it more as compared to the ones with suspicious related to the tasks (Bandura, 1995). Additionally, self-efficacy beliefs can be developed as a consequence of other people’s verbal persuasion, and the duty of people who persuade others is crucial in terms of development of self-efficacy beliefs (Pajares, 1997).

2.4.4. Physiological and affective states

Physiological and emotional states are important in order to make a decision about people's competences to some extent. This can be seen as another way to change the efficacy beliefs of people by improving physical state, decreasing stress and negative tendency, and as at the end, changing the wrong interpretation of body (Bandura, 1995). Pajares (1997) asserted that people can change the way that they think, and as a result of this, self-efficacy has also effect on their physiological state.

2.5. Integrated Model

"Integrated Model" is suggested by Tschannen-Moran et al. (1998) for the purpose of finding a solution of the lack in clarity as a consequence of the theories explained in the previous parts of the current study. Furthermore, it combines these two bases of efficacy. According to this model, attributional analysis and interpretation made for Bandura's sources of efficacy have the greatest impact on efficacy beliefs. However, it is noted that teachers' feeling of efficacy is a context specific subject, thus it can change depending on various teaching situations.

In Integrated Model, there are two dimensions revealed for the determination of teacher efficacy measurement. These are General Teaching Efficacy (GTE) and Personal Teaching Efficacy (PTE) which will be explained in detailed in the next part of the current study. Assessing teaching tasks and their contexts, it is considered that the importance of elements that complicate teaching is opposed to the evaluation of sources making teaching progress easier. For the self-perceptions of teaching competence assessment, teachers evaluate their abilities or features in their specific teaching contexts. The interplay between these factors influences the decisions related to their self-efficacy in teaching tasks.

As explained above, Bandura (1997) delineated four sources of efficacy as follows: mastery experiences, vicarious experience, verbal persuasion, and physiological and affective states. These sources support the analysis of teaching task and self-perceptions of teaching competence. Moreover, they have various influences relying on cognitive processing. As Bandura (1997) pointed out that mastery experiences are the strongest efficacy source. Efficacy beliefs become stronger at the time that a person has success in a difficult task with little help or in the early phases of learning with few problems. Furthermore, an increase is observed in degree of self-perception in teaching capacity with an increase in physiological and emotional arousal. Concerning vicarious experiences, perception for the nature of the teaching task is maintained by observing other teachers. Additionally, it can have an influence on abilities of the observer teachers. As regards verbal persuasion, it is possible to be general or specific. It can contribute to the nature of teaching, provide support and strategies in order to find solutions for situational problems, and suggest particular assessment related to teachers' performance. Furthermore, self-perceptions related to teaching competence increase with the level of emotional and physiological arousal in a teaching situation (Tschannen-Moran et al., 1998).

The role of cognitive processing is to decide how all these four sources will be affected, and how they will have an impact on analysis of teaching task and assessment of personal teaching competence. The interplay between task analysis and competence sequentially has an important influence on the development of teacher efficacy. For teachers, it is necessary to assess the requirements of expected teaching situation to decide on efficacy. This also leads to make assumptions related to difficulty of tasks and requirement to have success in that teaching context. As seen in Figure 3, "Assessment of personal teaching competence" is classified in a different part from "Teacher efficacy" in the model (Tschannen-Moran et al., 1998).

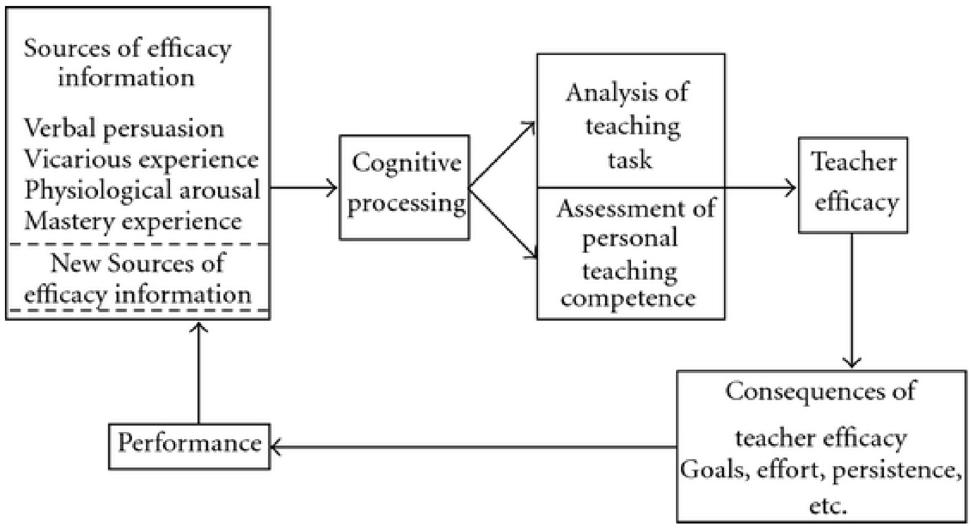


Figure 3. *The cyclical nature of teacher efficacy* (Tschannen-Moran, Woolfolk Hoy, and Hoy, 1998, p.228)

In this model, teacher efficacy is defined and explained in the cyclical nature as: “The teacher’s belief in his or her capability to organize and execute courses of action required to successfully accomplish a specific teaching task in particular context” (Tschannen-Moran et al., 1998, p.233). It is also suggested that having higher level of efficacy produces more effort and persistence. Thus, it will result in better teaching performance and also higher level of efficacy (Tschannen-Moran et al., 1998). Supporting this idea, Pajares (1992) put an emphasize on the power of people’s beliefs more in defining a problem and arranging tasks as compared to their knowledge.

2.6. Measurement of Teacher Efficacy

Although it is not easy to measure efficacy beliefs of teachers, various instruments have been developed for achieving this purpose. This part provides detailed information about the measurement of teacher efficacy.

RAND studies were the starting point for teacher efficacy measurement. In order to investigate teachers’ perceptions related to their competences, teachers are asked to demonstrate to what extent they agree with two items of inquiry. The name given for these items is “Teacher Efficacy” (TE) which shows teachers' beliefs about the level that they are in control of students' motivation and learning as the results of teaching (Tschannen-Moran, and Woolfolk Hoy, 2001).

RAND Item 1:"When it comes right down to it, a teacher really can't do much because most of a student's motivation and performance depends on his or her home environment"(Tschannen-Moran, and Woolfolk Hoy, 2001, p.784).

Teachers who agree with Item 1 strongly believe that the environment has a strong effect on their ability to teach, and support for their teaching is out of their control, they are external. This opinion about the influence of external factors in comparison to the effect of teachers and schools is called General Teaching Efficacy (GTE) (Tschannen-Moran, Woolfolk Hoy and Hoy, 1998; Tschannen-Moran, and Woolfolk Hoy, 2001)

RAND Item 2:"If I really try hard, I can get through to even the most difficult or unmotivated students" (Tschannen-Moran, and Woolfolk Hoy, 2001, p.785).

Teachers who express a high level of agreement with Item 2 have a trust in their teaching abilities in even difficult cases. The teachers consider that the support for their teaching is in their control which refers to internal. Teachers' ideas about the effect of their internal power on motivation and learning of students can be explained as Personal Teaching Efficacy (PTE) (Tschannen-Moran, Woolfolk Hoy and Hoy, 1998; Tschannen-Moran, and Woolfolk Hoy, 2001).

Following the RAND studies, different instruments were developed. Rose and Medway (1981) prepared a measure called "Teacher Locus of Control" (TLC) with 28 items. The purpose of the scale is to measure generalized expectancies of teachers in terms of their control over students' achievement or failure. According to this scale, it is necessary for teachers to confirm the external or internal power over different cases in the classroom. A significant relationship is detected between the scores obtained from TLC and RAND items including GTE and PTE and also TE (Tschannen-Moran, and Woolfolk Hoy, 2001). Rose and Medway (1981) considered that TLC estimates teachers' behaviours better than Rotter's interal-external scale depending on its connection with teaching context. However, this scale has been rarely used in the literature for two decades (Tschannen-Moran, and Woolfolk Hoy, 2001). Furthermore, Guskey (1981) promoted another scale called “Responsibility for Students Achievement” (RSA) in order to assess teachers’ beliefs in the sense of their students’ achievement and failure. Similar to TLC, this scale proposes to assess teachers’ beliefs as external responsibilities contrasting with internal ones. The scale consists of 30 items related to positive and negative cases possibly happening in the classroom. Guskey (1981) suggested four types of reasons for achievement or failure as following: specific teaching competences, the effort expended for teaching, difficulty of tasks, and luck. The result of the study revealed a strong correlation between overall responsibility and responsibility for student achievement and failure (Guskey, 1981). Additionally, the other instruments are “The Webb Efficacy Scale” developed by Ashton, Olejnik, Crocker and McAuliffe (1982), and “Teacher Efficacy Scale” by Gibson and Dembo (1984) (Tschannen-Moran, and Woolfolk Hoy, 2001).

A range of instruments were developed to measure efficacy beliefs of teachers. However, the variety of instrument caused a chaos on how to determine their beliefs in the most excellent way. Bandura (undated) designed a new scale which is an expanded form with 30 items and 9 points. This scale evaluates the efficacy beliefs of teachers from many different aspects. Its subscales are (1) efficacy to influence decision making (e.g. How much can you influence the decisions that are made in the school?), (2) efficacy to influence school resources (e.g. How much can you do to get the instructional materials and equipment you need?), (3) instructional efficacy (e.g. How much can you do to influence the class sizes in your school?), (4) disciplinary efficacy (e.g. How much can you do to get children to follow classroom rules?), (5) efficacy to enlist parental involvement (e.g. How much can you do to get parents to become involved in school activities?), (6) efficacy to enlist community involvement (e.g. How much can you do to get community groups involved in working with the schools?), and (7) efficacy to create positive school climate (e.g. How much can you do to make the school a safe place?) (Tschannen-Moran et al., 2001).

Although there have not been many studies using this scale detected by the researcher of the current study, Bandura's work was as a step for the development of another instrument. The name of this new instrument is "Teacher Sense of Efficacy Scale" (TSES) by Tschannen-Moran et al (2001). Based on the Integrated Model, the researchers aimed to evaluate individual ability and task analysis with regards of specific teaching contexts and resources. TSES was developed at the end of a seminar on self-efficacy for pre-service teachers at the Ohio State University. The scale has three factors. The first factor is "efficacy for instructional strategies" about teachers' beliefs about their competences for presenting their instructions. The second factor is "efficacy for classroom management" as respects to their confidence in their abilities for managing the classroom. The third factor is "efficacy for students' engagement" concerning the beliefs on their skills to engage students in learning. TSES has both long form with 24 questions and short form with 12 questions. TSES is considered to be superior to the instrument of teacher efficacy developed earlier because it has a combined and fixed structure and evaluates a wide variety of competences without being too detailed (Tschannen-Moran et al. 2001).

2.7. Studies on Teacher Efficacy in EFL/ESL Contexts

Efficacy perception of language teachers has been a remarkable issue in the related literature. Researchers conducted studies in different EFL and ESL contexts especially focusing on various factors such as being a native or non-native foreign language teachers, teaching experience, classroom management (Shim, 2001; Liaw, 2004; Chacon, 2005).

As one of the researchers carrying out a study on teacher efficacy, Shim (2001) explored the teacher efficacy perceptions of Korean teachers of English in terms of various variables one of which was classroom management skills. 106 in-service teachers working in middle or high school took part in this study. The results of the study showed that participants who have higher levels of PTE have also higher levels of classroom management skills. However, almost no relationship was found among GTE and classroom management skills.

From another perspective, Liaw (2004) examined the variation among native and non-native foreign language teachers in terms of two main area “teacher efficacy” and “teacher perceptions of language teaching”. The sample group of the study consisted of one hundred and ninety six language teaching assistants from six language departments at a university. The outcomes of the study yielded that there is a positive correlation among their perceptions of language teaching and level of teacher efficacy.

In more recent times, Chacon (2005) conducted a study to examine sense of efficacy for teaching among a group of EFL Venezuelan middle school children. A total of 100 EFL middle school teachers in the western part of Venezuela took part in the study. The results of the study pointed out that participants evaluated their own skills for motivating the students to learn English as low, but they perceived themselves more capable of planning instructional strategies, offering explanations, and assessing students and managing their behaviours.

2.8. Studies on Teacher Efficacy in Language Teaching in Turkey

As parallel to the increase in the number of studies related to the ESL and EFL around the world, some studies have been conducted in both pre-service and in-service contexts in Turkey.

Researchers carried out studies on in-service teacher efficacy addressing the relationship of teacher efficacy with three sub-scales of student engagement, classroom management, instructional strategies, or some other variables such as socio-demographic factors including teaching experiments and gender, self-reported English proficiency levels, and self-reported practice of Communicative Language Teaching (Ortaçtepe, 2006; Tunç-Yüksel, 2010; Yılmaz, 2011).

Among the earlier studies on teacher efficacy, Ortaçtepe (2006) aimed to explore the connection between efficacy beliefs of Turkish EFL teachers and their self-reported practice of Communicative Language Teaching. Fifty participants who are teaching English for 7^{th}, 8^{th} and 9^{th} grades in various private in İstanbul took part in this study. It was concluded that there is a significant relationship among teacher efficacy and their practice of Communicative Language Teaching.

In the context of primary school, Tunç-Yüksel (2010) designed a research to examine level of teachers' sense of self-efficacy; the differences between teacher efficacy and student engagement, teacher efficacy and instructional strategy use, and teacher efficacy and classroom management; the effect of socio- demographic factors which were teaching experiments and gender on teacher efficacy; and the relationship between their perceived English proficiency and teacher efficacy. A total of 144 EFL teachers from various public primary schools took place in the study. The outcomes of the study demonstrated that the participants had a high level of efficacy as a general; and, they reported higher level of self-efficacy in classroom management and instructional strategy use than in involving students in lesson. They stated three reasons for the result of lower level of students' involvement following: (1) curricula, standardized tests, and predetermined teaching methods; (2) uncooperative school environment; and (3) students' profile. Furthermore, a relationship was detected between these teachers' self-efficacy and perceived level of English proficiency level. However, no significant relationships were detected between teacher efficacy and teaching experiment, and between teacher efficacy and gender.

More recently, Yılmaz (2011) investigated the Turkish EFL teachers' perception of self-efficacy, and their sense of self-efficacy in terms of personal teaching abilities and their self-reported proficiency level. A total of 54 English language teachers whose working experiences change between 1 year and 16 years in Çanakkale took part in the study. The outcomes of the study yielded that there is a positive relationship between the perceptions of teachers' efficacy and their self-reported proficiency level. Moreover, it was revealed that the teachers considered themselves more efficient in instructional strategies as compared to classroom management or student engagement.

There have also been particular studies focusing on the perceptions of pre-service teacher efficacy carried out in EFL pre-service teachers assessing its relationship with three sub-scales of student engagement, classroom management, instructional strategies, or some other variables such as teaching practicum, peer coaching, role of mentors, and metacognitive awareness (Göker, 2006; Atay, 2007; Pekkanli-Egel, 2009; Alcı and Yüksel, 2012).

Göker (2006) designed a research in order to examine whether EFL pre-service teachers prepared with both teaching practicum and peer coaching training indicate higher level of self-efficacy and instructional skills as compared to the candidates practicing only with instructors' visits in a traditional way. The findings of the study addressed that there is a positive influence of peer coaching on the teacher candidates' performance. Additionally, it was also revealed that there is an influence of videotape feedback on the development of pre-service teachers' teaching behaviour efficaciously.

Atay (2007) constructed a study to examine variations in pre-service teachers' efficacy perceptions during teacher training process and the elements possibly having an influence on the change. The outcomes of the study yielded that there is a statistically significant level of increase in scores of student engagement in the final part of the practicum. However, there is a statistically significant level of decrease in scores of instructional strategies at the end of training period. Additionally, an increase was also detected in the scores of classroom management.

Pekkanli-Egel (2009) investigated whether student teachers have a perception of self efficacy in ELT Department at a public university in Turkey; and, if so, the role of mentors who provide effective feedback. The outcomes of the study yielded that the participants' levels of self-efficacy are high, and they give the impression of being confident about their efficacy. It was also concluded that instructors' ability has a significant effect on student teachers' success, and their behaviour has an effect on pre-service teachers' efficacy.

Alcı and Yüksel (2012) carried out a study in order to explore the extent English language student teachers' perception of self-efficacy and metacognitive awareness forecast their academic success, and the variation in their sense of efficacy and metacognitive awareness in terms of their grades. The results of the study addressed the influence of teachers' self-efficacy and metacognitive awareness on their performance. It was concluded that teachers' self-efficacy and metacognitive awareness develop over time.

Most of the aforementioned researchers put an emphasis on these three sub-scales of teacher efficacy (Ortaçtepe, 2006; Tunç-Yüksel, 2010; Yılmaz, 2011; Atay, 2007) and especially on instructional strategies (Göker, 2006). Nowadays, technology has a crucial role in improvement of these sub-scales because students will be more efficient when technology becomes a part of the courses. Some other researchers focused on another element called "Technological Pedagogical Content Knowledge" (TPACK) that is considered to have an influence on pre-service teachers' efficacy beliefs (Niess, 2005; Sahin, Akturk, and Schmidt, 2009; Abbitt, 2011). One of these researchers is Niess (2005) who carried out a research to investigate the development of pre-service teachers' pedagogical content knowledge with regards to technology integration. Twenty-two pre-service teachers who took part in a graduate level teacher education program for one year participated in the study. At the end of the program, it was concluded that participants had different levels of improvement in TPACK. While 14 of the participants developed their competences for using technology to involve students in their subject areas, the others needed more practice in TPACK. Among those participants, five cases were discussed in detail. In another study, Sahin, Akturk, and Schmidt (2009) explained the term aforementioned as "teacher efficacy" in a broader perspective as "vocational self-efficacy" meaning the perceptions of people related to their abilities required for their jobs. In the study, they examined the pre-service teachers' vocational self-efficacy beliefs in terms of technological pedagogical content knowledge. The outcomes of the study yielded that TPACK has an influence on the pre-service teachers' efficacy beliefs. Furthermore, Abbitt (2011) explored the relationship among teachers' efficacy beliefs and TPACK with a group of pre-service teachers. The outcomes of the study yielded that participants' levels of teacher efficacy perceptions increased with an increase in technological knowledge, pedagogical knowledge, and technological pedagogical knowledge.

All these studies were conducted in various countries and in fields other than English language teaching. Nevertheless, no single study has been found about the relationship between EFL pre-service teachers' efficacy beliefs and TPACK by the researcher. The aim of current study is to broaden the efficacy beliefs of EFL pre-service teachers by investigating its relationship with TPACK in Turkey.

2.9. Introducing Technological Pedagogical Content Knowledge (TPACK) Framework

Technological Pedagogical Content Knowledge (TPACK) is a framework developed by Mishra and Koehler in order to integrate technology in teaching. Shulman provided a basis for Technological Pedagogical Content Knowledge with the explanation of Pedagogical Content Knowledge (1987) as follows:

> It represents the blending of content and pedagogy into an understanding of how particular topics, problems, or issues are organized, represented, and adapted to the diverse interests and abilities of learners, and presented for instruction (p.8).

According to Koehler and Mishra (2008), teaching is characterized as an ill-structured discipline which shows a complexity of concepts for a wide range of qualities in various situations. Teaching requires teachers to combine the understanding of content, students' thinking and learning, and technology. As is characteristic of an ill-structured discipline, there is no single best solution for the problems of teaching in different contexts. It is even more difficult to overcome the challenge of integrating technology into teaching.

Koehler and Mishra (2008) defined technology as the tools designed in order to integrate sources for achieving expected products, finding solutions for problems, meeting needs, and fulfilling desires. There are two sorts of uses with respect to this definition. The first use illustrates the use of a tool or a technique individually. For instance, "Internet technology" is related to the tool called Internet. The second use includes the tools and techniques as a whole for example "educational technology" contains all the tools and techniques useful for education. In the scope of this definition, there are two other relevant concepts: analog technologies (including chalkboards, pencils and microscopes); and digital technologies (including computers, bloggings, and Internet).

Koehler and Mishra emphasised that “particular technologies have specific affordances and constraints” (p.5) as a crucial property of technology. In the general sense, affordance means perceived or real features of objects such as a hammer used for hitting something but not turning it. In an educational context, e-mail can be used for communication but not for synchronous or face-to-face communication. However, constraints of technology are different from affordances in the way that constraints are “inherent” properties of technology and “imposed from outside” (pp.5-6). Another useful term “functional fixedness” addresses how our ideas are related to the function of objects that can demonstrate our ability to use them for other functions. The use of email for creative writing as a derivation from its original function demonstrates the application of technology to this concept (p.6). Therefore, educators have to use existing technological tools in a creative way for pedagogical purposes (2008).

Koehler and Mishra explained three inherent features of digital technologies that make technology integration difficult. The first states that “Digital technologies are protean in nature” (p. 7). It is possible to use digital technologies in several different ways. Depending on the protean nature, digital technologies can be used in almost all areas of human life. However, using various symbol systems complicates teachers’ use of technology in education. The second states that “Digital technologies are functionally opaque” (p.8) which means the inner-workings are concealed from people who use these technologies. Most of the tools generally known at present are created for business environment. Thus, it requires the rearrangement of the opacity feature in order to use it for pedagogical objectives. The third states that “Digital technologies are unstable” (p.8). This refers to the rapid change that characterizes digital technologies. This requires a teacher’s enthusiasm to accommodate and struggle with the unstable feature of technology during his or her entire teaching career (pp. 8-9). Other limitations were also identified that are related to social, institutional, or contextual issues. For example, teachers may not have enough experience related to technology integration in teaching. Furthermore, considering the areas of technology and pedagogy separately makes a teacher’s role more difficult, concurrently bothering them to integrate technology in teaching. Moreover, each teacher has his or her classroom environment for a particular subject area, and he or she needs to know the appropriate technologies for his or her own context (2008, pp. 9-10).

Although technology integration seems to help solve educational difficulties, Koehler and Mishra explained technology integration as an ill-structured problem. They state that teaching with technology is a “wicked problem” which has various and changing necessities (pp. 10-12). The variations of people in the specific educational environment including students, teachers and administrators, bring a diversity in educational purposes and beliefs, thus, making the situation more difficult (2008, pp.10-11).

2.10. Development of TPACK

There has been a wide range of studies related to the idea of technology integration in educational settings. First, Mishra (1998) pointed out the point of three components which are content, pedagogy, and technology. The study tried to improve an educational computer program whose arrangement was founded on the nature of subject area and educational theory for an ill-structured domain. Additionally, Pierson (1999, 2001) explained the relationship among content, pedagogy and technology with the diagram shown in Figure 4.

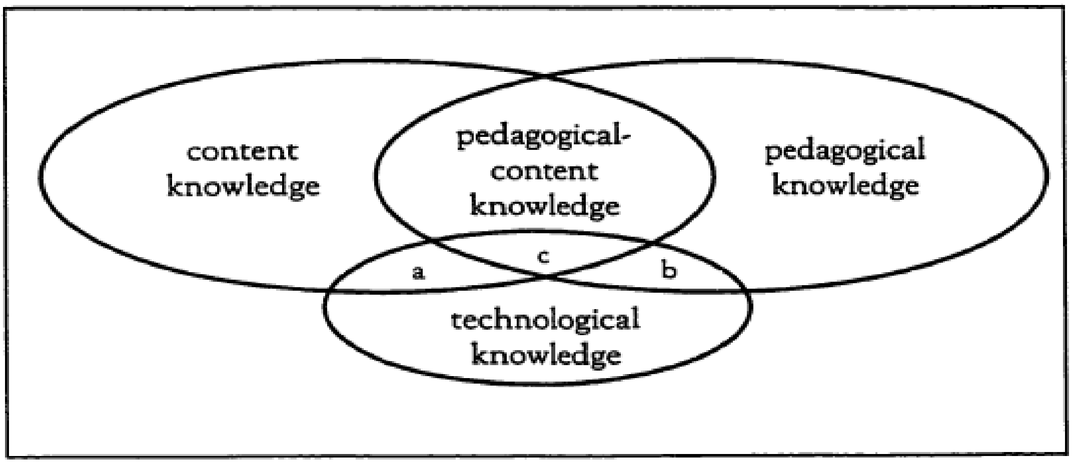


Figure 4. *Relationship among content, pedagogy and technological knowledge* (Pierson, 2001, p.427)

According to Figure 4, “a” demonstrates content knowledge related to technology knowledge, “b” demonstrates pedagogical knowledge related to technology knowledge, and “c” demonstrates the integration of content, pedagogical and technological knowledge. This figure is very similar to the diagram of TPACK. Technology knowledge consists of basic technology competency and comprehension of the specific properties of various types of technology. When effectively integrating technology into teaching, teachers can take advantage of the vast majority of content knowledge and pedagogical knowledge (Pierson, 2001). Hughes (2004) drew on a different term “technology integrationist” which refers to those who prefer to combine technology carefully with subject matter in order to boost students’ learning. Hughes (2004) also provided four principles explaining how to use technology in learning experiences to increase the possibility of becoming a technology integrationist for both pre-service and in-service teachers; (1) “connect technology learning to professional knowledge” which indicates the essential relation between technology learning and teachers’ professional knowledge (2) “privilege subject matter and pedagogical content connections” referring to the limited effect of technology on education, (3) “use technology learning to challenge professional knowledge” which suggests using technology to improve teachers’ beliefs on the inherent features of teaching and learning, and (4) “teach many technologies” which denotes the requirements of teaching about various technologies.

Based on Shulman’s idea of PCK, another study was carried out by Angeli and Valanides (2005). They introduced a new term “ICT-related PCK” forming a specific combination of various sources of teacher knowledge involving content knowledge, pedagogical knowledge, knowledge of students, environmental conditions and ICT knowledge. According to their explanation, ICT knowledge is defined as “knowing how to operate a computer, knowing how to use a multitude of tools/software, and about their affordances” (p. 294). Additionally, Angeli and Valanides (2005) explained five principles about knowing the ways to: (1) identify topics to be taught with ICT; (2) identify representations to transform the content; (3) identify teaching strategies; (4)

select ICT tools to afford content transformations and support teaching strategies; and (5) infuse ICT activities in classroom instruction (p. 294).

Correspondingly, Niess (2005) conducted a study in order to explore pedagogical content knowledge development of pre-service teachers in terms of technology integration. Four integral parts of pedagogical content knowledge were modified to identify technology-enhanced pedagogical content knowledge which is called TPCK. The integral parts are (1) an overarching conception of what it means to teach a particular subject integrating technology in the learning, (2) knowledge of instructional strategies and representations for teaching particular topics with technology, (3) knowledge of students' understandings, thinking, and learning with technology in a particular subject, and (4) knowledge of curriculum and curriculum materials that integrate technology with learning in the subject area (Niess, 2005).

2.11. The TPACK Model

In the contemporary view of this issue, Mishra and Koehler (2008) define pedagogical content knowledge (TPACK) as "how teachers' understanding of technologies and pedagogical content interact with one another to produce effective teaching with technology" (p. 12). There are three fundamental components of the TPACK model which are content, pedagogy and technology. Specifically, the interplay among these components is crucial represented as pedagogical content knowledge (PCK), technological pedagogical knowledge (TPK), technological content knowledge (TCK), and technological pedagogical content knowledge (TPCK) (see Figure 5).

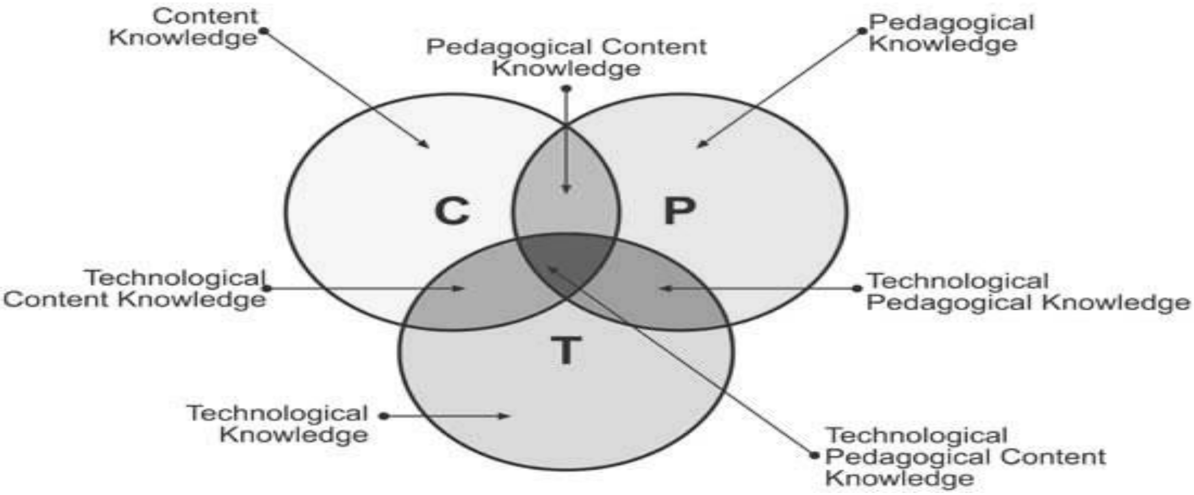


Figure 5. *TPCK model and its fundamental components* (Mishra and Koehler, 2008, p.12)

A developing form of knowledge, TPACK was created from the interaction of the three fundamental components (content, pedagogy, and technology) rather than individual components. Koehler, Mishra and Cain (2013) explained the concept as follows:

> TPACK is the basis of effective teaching with technology, requiring an understanding of the representation of concepts using technologies, pedagogical techniques that use technologies in constructive ways to teach content, knowledge of what makes concepts difficult or easy to learn and how technology can help redress some of the problems that students face, knowledge of students' prior knowledge and theories of epistemology, and knowledge of how technologies can be used to build on existing knowledge to develop new epistemologies or strengthen old ones (p.16).

TPCK was first presented as a theoretical base to reveal teachers' knowledge of the efficient integration of technology in educational research (Mishra and Koehler, 2009). Despite its ideological significance, the acronym TPCK was challenging due to its complicated name causing a loss in its powerful meaning and function. The problem was negotiated at the 9thAnnual National Technology Leadership Summit, and its name was changed to TPACK. The new acronym TPACK did not only have an extra letter, but it also highlighted three types of knowledge (Technology, Pedagogy and Content). It should be considered as a “Total PACKage” in order to improve students’ learning with the integration of technology (Thompson and Mishra, 2007, p.38).

2.11.1. Content knowledge

Content knowledge (CK) can be defined as the subject matter that is to be learned or taught such as science, history, or mathematics. CK has a major importance for teachers because they have to know concepts, theories and ideas, as well as have an ability to comprehend the fundamentals of the discipline to a great extent (Mishra and Koehler, 2008). Additionally, it should be noted that students may learn incorrect information unless their teachers have comprehensive content knowledge (Koehler, Mishra and Cain, 2013). Furthermore, Shulman (1986) states:

> The teacher need not only understand that something is so; the teacher must further understand why it is so, on what grounds its warrant can be asserted, and under what circumstances our belief in its justification can be weakened and even denied (p. 9).

It is possible for teachers to use content knowledge for real life experiments on the condition that they comprehend the subject area and think inside its limits. This makes learners’ use of content knowledge easier for the things they learned before (Mishne, 2012).

2.11.2. Pedagogical knowledge

Pedagogical knowledge (PK) is described as profound knowledge about the processes of educational methods including general educational purposes, values, and goals. Techniques or methods which teachers use in classes such as disposition of learners, learning assessment strategies can be given as the examples of pedagogical knowledge (Mishra and Koehler, 2008). Teachers can comprehend how learners build the knowledge, gain abilities, how they get in the mood, and have a positive tendency for learning (Koehler, Mishra and Cain, 2013).

Certain strategies help in technology integration such as managing the classroom, behaving in a flexible way, and evaluating students’ learning. An element of the main part of knowledge, pedagogical knowledge makes the teachers' job of analysis and interpretation of their teaching performance easier regardless of technology use (Mishne, 2012).

2.11.3. Pedagogical content knowledge

Pedagogical content knowledge (PCK) is defined as "special amalgam of content and pedagogy that is uniquely the province of teachers, their own special form of professional understanding" (Shulman, 1987, p.8). It encompasses teaching, learning, curriculum, assessment, and pedagogy. According Shulman (1987),

> PCK identifies the distinctive bodies of knowledge for teaching. It represents the blending of content and pedagogy into an understanding of how particular topics, problems or issues are organized, represented, and adapted to diverse interests and abilities of learners, and presented for instruction. Pedagogical content knowledge is the category most likely to distinguish the understanding of the content specialist from that of the pedagogue (p. 8).

PCK reveals the cases that improve learning and the network among pedagogy, curriculum and assessment (Mishra and Koehler, 2008). When dealing with a group of students who have various types of learning and different levels of background knowledge, teachers must attempt to adjust the curriculum in order to satisfy requirements of the whole group (Mishne, 2012).

The most crucial point in PCK is the transformation of content knowledge in order to teach. It is necessary for teachers to be creative, to present content knowledge in different forms, and to adjust materials used for instructions for answering various requirements (Mishra&Koehler, 2008; Mishne, 2012).

2.11.4. Technology knowledge

Technology knowledge (TK) can be explained as the fluency of information technology. It necessitates that people comprehend information technology deeply in order to implement it efficiently in various parts of their lives, to identify the occasions that will help or delay attaining their goals, and to modify changes in information technology. It is possible for teachers who obtain TK to produce several different sorts of tasks with technology. In this sense, TK is distinguished as an unlimited and developing concept interacting with technology (Mishra and Koehler, 2008; Koehler, Mishra & Cain, 2013).

As technology constantly develops, TK requires adaptation over time (Mishra and Koehler, 2006). Having adequate technology knowledge, teachers can improve students' learning and make them ready for the requirements of the modern age by benefiting from technological tools (Mishne, 2012).

2.11.5. Technological content knowledge

Technological content knowledge (TCK) can be interpreted as the perception of the way that both technology and content have an effect on each other by expanding and restricting one another. Teachers have to be proficient in their subject matter. Moreover, they have to know the specific technologies to teach the content in the best way and how subject matters address and alter technology (Mishra and Koehler, 2008).

Mostly depending on the previous experiences and knowledge, teachers make some choices in order to find the best ways of teaching every day. As being efficient in technology, they are able to pick out the appropriate technological tools for assisting students in comprehending the subject better (Mishne, 2012).

2.11.6. Technological pedagogical knowledge

Technological pedagogical knowledge (TPK) is the concept of how teaching and learning become different with the use of a special technology. It contains the recognition of constraints and affordances belonging to various technological tools in terms of pedagogical designs and strategies (Mishra and Koehler, 2008). Well-known programs such as Microsoft Office for business, blogs and podcasts for entertainment and communication are generally not produced for educational purposes. Thus, TPK has a vital role because it needs a creative and open-minded way in order to develop students' learning (Koehler, Mishra and Cain, 2013).

It is emphasized that the realization of technology, pedagogy, and content are related to educational contexts. Teaching should be designed to consider the classroom situation, the school characteristics, and the national policies affect learning. Furthermore, individuals will teach each course in slightly different ways based on his or her pedagogy. Therefore, it is not possible to apply each technological solution to all classes (Koehler, Mishra and Cain, 2013). Mishra and Koehler (2006) emphasize the effect of these components on education as follows:

> Viewing any of these components in isolation from the others represents a real disservice to good teaching. Teaching and learning with technology exist in a dynamic transactional relationship (Bruce, 1997; Dewey & Bentley, 1949; Rosenblatt, 1978) between the three components in our framework; a change in any one of the factors has to be ‘‘compensated’’ by changes in the other two (p. 1030).

There is a powerful effect of the introduction of TPACK model on educational technology which encourages teacher and teacher educators for assessing their understanding of technology use in the educational settings (Cox and Graham, 2009).

It is not easy to integrate teaching with technology. According to TPACK, each of the fundamental components has both their own individual meaning and also one with the combination of the others. A creative and dynamic balance among these components is constantly required in order to teach successfully with using technology.

2.12. Evaluation of TPACK Model

There have been various tools with reference to TPACK in literature. As a starting point, Koehler, Mishra, Yahya, and Yadav (2004) carried out a study related to the development of TPACK. They suggested a theoretical framework required as ways of the combinations among content, pedagogy, and technology for efficient technology integration. The researchers emphasized the link, interplay, affordances and constraints among the components. As a result, dynamic transactional connections were detected in teaching and learning with the use of technology. Following that study, Koehler and Mishra (2005) developed a survey in order to evaluate the design seminar for creating online courses prepared by the faculty members and master students. The result of the study put forward that participants seemed to improve both their knowledge of the use of technology and TPACK (Koehler and Mishra, 2005; Kabakçı-Yurdakul, Odabaşı, Kılıçer, Çoklar, Birinci, and Kurt, 2012). Grounded on Koehler and Mishra (2005) and Shulman (1986), Archambault and Crippen (2009) used a scale that was designed and developed by Koehler and Mishra. It consisted of 24 items to assess teachers' knowledge of the prosperity of K-12 distance education with regards to the TPACK components. This can be seen as just the first step for investigating the complicated relation among three major components aforementioned (Archambault and Crippen, 2009).

An instrument was developed by Schmidt, Baran, Thompson, Koehler, Mishra, and Shin (2009) in order to evaluate pre-service teachers' TPACK. The researchers aimed to design an instrument for pre-service teachers of elementary or early childhood education in various subject areas. The study emphasized that the instrument developed in the scope of the study was the starting point for encouraging pre-service teachers with regards to TPACK development (Schmidt, Baran, Thompson, Koehler, Mishra, and Shin, 2009). Correspondingly, Chai, Koh, and Tsai (2010) modified the instrument developed by Schmidt et al. (2009) to assess pre-service teachers' sense of TPACK. As a result of the study, all three major components had influence on pre-service teachers' TPACK, and pedagogical knowledge had the highest effect (Chai, Koh, and Tsai, 2010). Sahin (2011) also developed a new instrument for pre-service teachers with seven subscales; (a) technology knowledge, (b) pedagogy knowledge, (c) content knowledge, (d) technological pedagogical knowledge, (e) technological content knowledge, (f) pedagogical content knowledge, and (g) technological pedagogical content knowledge.

Archambault and Barnett (2010) investigated nature of TPACK framework. The result of the study pointed that TPACK framework is useful for organizational stances, but it is difficult to divide into its components raising question related to being presence in practice. Additionally, the validity of TPACK was also explored in the same study, and it was found that it is entangled to evaluate these components depending on the feature to inseparability. As a consequent, the common point of aforementioned instruments was the evaluation of the TPACK components separately which poses a problem in terms of TPACK idea.

Kabakçı-Yurdakul, Odabaşı, Kılıçer, Çoklar, Birinci, and Kurt (2012) highlighted that TPACK components were investigated one by one instead of as a whole in the studies related to TPACK development. Depending on the limited number of studies related to evaluation of integration and interaction of these components and scarcity of instrument, Kabakçı-Yurdakul et al. (2012) developed a scale in order to measure pre-service teachers TPACK evaluating TPACK components not separately but together.

2.13. Studies on TPACK in Various Contexts

Technological developments and using technology in education have generated a great a deal of research interest in most parts of the world. There have been studies conducted on in-service teachers with regards to the subject areas as follows: science (Guzey and Roehrig, 2009), chemists (Karakaya, 2013), mathematic (Landry, 2010), and a group of teachers from various fields (Archambault and Crippen, 2009; Uygun, 2013). In these studies, TPACK has been investigated by detecting the effect of some variables that are teaching styles, and a set of activities called “learning by design”.

In the field of science, Guzey and Roehrig (2009) designed a study to investigate teachers’ development in content, pedagogy, and technology knowledge (TPACK). The result of the study showed that there is a positive influence of professional development program on the participants’ development of TPACK in varying levels.

In chemistry, Karakaya (2013) aimed to reveal TPACK levels of 103 chemistry teachers working in 17 different cities in Turkey. The results of the research showed that the teachers do not pursue the developments in educational technology. Additionally, they reported that teachers who received education about TPACK during their undergraduate studies have higher confidence as compared to the others who did not receive.

In the field of mathematics, Landry (2010) carried out a research to develop a survey for the purpose of measuring mathematic teachers’ TPACK.

The outcomes of the study yielded that participants have a trust and willing for technology integration in their courses, however, they emphasize their inadequacy in ways of technology use. Additionally, Mutluoğlu (2012) explored in-service mathematics teachers' TPACK in terms of their preferences in teaching styles. The results indicated that there is a significant relationship among TPACK components and teaching styles. Additionally, differences at content knowledge, technological knowledge, and technological pedagogical knowledge were detected providing the advantage to the teachers with computer.

Some other researchers also investigated TPACK with a group of teachers from various fields. Archambault and Crippen (2009) investigated TPACK knowledge of a wider group including 596 teachers in the US regarding three main components and their combinations. The results of the study demonstrated that the highest scores were detected in content, pedagogy, and pedagogical content knowledge. Namely, the participants felt less confident in these areas combining with technology. Moreover, the correlation between pedagogy and content (.690) was higher than the ones between technology and pedagogy (.289), and also technology and content (.323). In another context, Uygun (2013) carried out a research in order to examine TPACK development of a group of teachers in learning by design activities. The results of the study yielded participants had higher TPACK scores as compared to their scores at the beginning.

Learning to teach a content using technology is thought not to be same with learning it with technology (Niess, 2005). Thus, there have been a considerable number of studies on the development of TPACK with pre-service teachers in respect of different fields as follows: science (Kaya, 2010; Jang and Chen, 2010; Savaş, 2011; Timur, 2011), mathematics (Uğurlu, 2009; Canbolat, 2011), physical education (Semiz, 2011), a group of teachers from various fields (Niess, 2005), and English language (Kurt, 2012). These studies have examined TPACK identifying the effect of some variables that are teachers' classroom practices, knowledge of aims, curriculum and curriculum materials, instructional strategies, assessment, a design called "transformative model", their thinking styles, and application of a design study.

A crucial part of studies was conducted with various groups in science teaching. Kaya (2010) conducted a research in order to examine pre-service science and technology teachers' TPACK and their classroom practices related to a topic in the subject area. According to the results, there was a significant relationship among teachers' pedagogical knowledge and technological knowledge. However, there was not a significant relationship between content knowledge and technological knowledge of the teachers. Additionally, a significant relationship was detected between their classroom practices and TPACK. In a different study, Savaş (2011) aimed to explore the relationships among components of TPACK of pre-service science teachers and their knowledge on a topic in science that is genetics. The results of the study revealed positive significant correlations among TPACK components. Another research conducted by Timur (2011) was planned to investigate TPACK development of pre-service science teachers. The outcomes of the study yielded that teaching integrated with technology promotes particular TPACK components that are knowledge of aims, curriculum and curriculum materials, instructional strategies, and assessment. Furthermore, Jang and Chen (2010) proposed to explore the effect of a transformative model accompanying with peer coaching on the participants' TPACK knowledge. As a conclusion, it was revealed that the transformative model achieved to promote in the pre-service teachers' TPACK knowledge.

Some studies on TPACK were also conducted in the area of mathematics teaching. Uğurlu (2009) examined assessment knowledge and skills of pre-service mathematics teachers through the medium of TPACK. It was concluded that the participants made effort to use technology for assessment techniques in the form of technologically strengthened instruction at the time they used technology in the courses. Canbolat (2011) also designed a study in order to evaluate mathematics pre-service teachers' TPACK, determine their thinking styles, and reveal whether there is a relationship among these variables. The outcomes of the study showed that participants' TPACK and thinking styles changed depending on their gender, computer possession, and level of class.

In the field of physical education, Semiz (2011) conducted a study for the purpose of detecting pre-service physical education teachers' TPACK, Technology Integration Self Efficacy, exploring the relationship among the same variables, and investigating the impact of perceiving technology integration instruction on the scores of these variables. The results of the study demonstrated that the perceptions of the participants for all three variables are at a good level. Additionally, there was a significant moderate relationship among the variables (p<0.05). It was also revealed that university instructors' perception of technology integration into teaching affects participants' perceptions of these three variables positively. The outcomes of the study proposed to maintain development programs for instructors in teacher education programs, and to encourage both instructors and pre-service teachers in technology integration.

Determining a group of pre-service science and mathematics teachers as the sample group, Niess (2005) investigated the participants' development of TPACK in the scope of a teacher preparation program. As a consequence, it was revealed that participants had different levels of improvement in TPACK. Fourteen participants improved their abilities in using technology to involve students in their subject areas. However, the other participants needed more practice in TPACK.

As in English language teaching, Kurt (2012) carried out a research. The purpose of the study is to examine the TPACK development of Turkish pre-service teachers of English through a design study. According to the results of the study, it was suggested that combination of TPACK and the design approach applied in the study could be utilized in order to develop technology integration skills of pre-service teachers efficiently in the scope of programs at universities.

As above explained, there are some studies about pre-service teachers' TAPCK in various fields, but only one of them is related to English language teaching which is not enough. It is crucial to determine the role of technology in language learning by looking over the outcomes of other studies in the relevant literature.

2.14. Summary

This chapter has demonstrated theoretical database together with the studies and their results conducted related to both teacher efficacy and TPACK. At the beginning, concepts and developments on teacher efficacy, efficacy sources, and models were explained. Following this, the theoretical database was illustrated with the studies conducted by various researchers (Liaw, 2004; Chacon, 2005; Ortaçtepe, 2006; Atay, 2007; Tunç-Yüksel, 2010). After that, detailed information on TPACK was provided including development stages, models, and evaluation of TPACK exemplifying with studies conducted by many researchers on TPACK (Koehler and Mishra, 2005, 2008; Mishra and Koehler, 2008; Kabakçı-Yurdakul, Odabaşı, Kılıçer, Çoklar, Birinci, and Kurt, 2012). Since the main aim of this study is to examine the relationship between Turkish EFL pre-service teachers' efficacy and TPACK, the rest of the chapter consisted of the previous studies related to the effect of technology in language learning, and teachers' role in using technology for language teaching. In the end, studies on the relationship between pre-service teachers' efficacy perceptions and TPACK were looked over.

The next chapter explains the details of the current study's methodology. It includes participants and settings, research tools, data collection procedures, and analytical procedures.

CHAPTER 3

METHODOLOGY

3.1. Introduction

In this chapter, detailed information about data collection and analysis is provided. Participants of the current study and the settings are described at the beginning. The following part contains a detailed explanation related to tools used in the study. The data collection period and analysis are offered at the end of the chapter.

3.2. Participants and Settings

The study was conducted in the Faculties of Education and English Language Teaching Departments in two cities of Turkey, in Spring Term of 2013-2014 academic year. A total of 110 fourth-year students took part in the study. Data were collected from four universities because they were accessible for the researcher. Thus, the groups participated in the study are convenience samples (Huck, 2008). Three of these universities are the state universities, and one of them is a private university. The state universities taking part in the study are Anadolu University, Marmara University, and Yıldız Technical University; and the private university is Yeditepe University. Distribution of participants related to universities is demonstrated in Table 1.

Table 1. *Distribution of Participants related to the Universities*

	Number	Percentage
University		
Anadolu U.	53	48.2
Marmara U.	15	13.6
Yeditepe U.	10	9.1
Yıldız Technical U.	32	29.1
Total	**110**	

As seen in Table 1, the percentages of pre-service teachers taking part are 48.2 in Anadolu University, 29.1 in Yıldız Technical University, 13.6 in Marmara University, and 9.1 in Yeditepe University. Most of the participants of the present study are students in Anadolu University (N=53). Following this, the second highest participation is in Yıldız Technical University (N=32), third one is in Marmara University (N=15), and last one is in Yeditepe University (N=10).

The aims of the English Language Teacher Training Programs are to train teacher candidates who have high levels in English language, have high content knowledge and skills in teaching, and aspire to conduct research and develop their competences. In line with these objectives, they have theoretical courses focusing on English Language Teaching. Both state and private universities follow the same curriculum determined by the Turkish Council of Higher Education. As a part of English Language Teaching Program, teacher candidates are provided with methodology courses like Approaches in ELT, ELT Methodology, and Teaching Language Skills; linguistic courses like English Linguistics, and courses increasing general English proficiency like Oral Communication Skills, Advanced Reading and Writing. Furthermore, there are other courses such as Educational Psychology, Guidance and Counselling, and Classroom Management provided to the whole Education Faculty. Additionally, aiming to develop teacher candidates' knowledge of content and pedagogy combining with technological knowledge, some courses are also provided in these universities taking part in the present study in varying levels.

English Language Teacher Training Programs also provide pre-service teachers with teaching experiences in real classroom contexts of various public and private schools. While some of these schools are equipped with the latest technology, others have only traditional school materials in the classrooms. Even the pre-service teachers' of the same university have teaching practices in various schools. Thus, the participants do not have equal opportunity of having technological devices in practicum schools.

3.3. Research Tools

At the beginning of the research tools, participants were asked to reply to the questions in "Teacher's Background Information". It was made up of four parts: Demographic information, personal experiences related to technology use, educational background related to technology use, and teaching experiences related to technology use. The demographic information part includes questions about their age, gender, name of the university they attend, and the aim of researcher to develop this part was to understand who the participants are in detailed. The other three parts were developed during a course related to Technological Pedagogical Content Knowledge by the researcher with the guidance of her advisor who gave the lecture. These parts consisted of items about the participants' technology use in personal experiences, in educational life, and in their teaching experiences. (see Appendix A).

In the current study, data were gathered through 3 main instruments: (1) English Teachers' Sense of Efficacy Scale to gather information related to their understanding of their efficacy levels (see Appendix B); (2) TPACK-Deep Scale for gaining information about combining technology, pedagogy, and content knowledge in the ways of both learning and teaching processes (see Appendix C); and (3) Open-ended questions to assess their self-report of how efficaciously they integrate and use technology in their teaching experiences.

3.3.1. English Teachers' Sense of Efficacy Scale (ETSES)

There have been various tools most of which were explained in the literature review part for assessing teachers' sense of efficacy. Considering the deficiencies of those instruments, Tschannen-Moran and Woolfolk Hoy (2001) developed a Teachers' Sense of Efficacy Scale (TSES) grounded on the Integrated Model.

Chacon (2005) modified this scale and developed a scale for evaluating English Teachers' Sense of Efficacy Scale (ETSES). ETSES involves five subscales as follows: (a) teachers' perceived efficacy for engaging students in learning EFL, (b) teachers' perceived efficacy for managing EFL classes, (c) teachers' perceived efficacy for implementing instructional strategies to teach EFL, (d) teachers' self-reported English proficiency, and (e) teachers' self-reported pedagogical strategies to teach English (communication-oriented and grammar-oriented strategies) (Chacon, 2005, p.262). In the current study, a short form of ETSES consisting of 12 items was used to determine pre-service teachers' efficacy levels (see Appendix B). This short form has three sub-scales as follows: efficacy for student engagement between questions 1 and 4, classroom management between questions 5 and 8, and instructional strategies between questions 9 and 12. A 9-point scale is used for the measurement of items. The Cronbach's alpha coefficients of efficacy were measured for all sub-scales as follows: .79 in student engagement, .83 in classroom management, and .81 in instructional strategies (Chacon, 2005). According to the results of the present study, the coefficient of student engagement sub-scale was .74, classroom management was .85, instructional strategies was .70, and the coefficient for the total scale was .88. These scores are high which indicates the consistency of the scale for the present study.

3.3.2. TPACK-Deep Scale

Established based on Koehler and Mishra's structure, a TPACK-Deep Scale was developed for the purpose of measuring pre-service teachers' technological pedagogical content knowledge by Kabakçı-Yurdakul, Odabaşı, Kılıçer, Çoklar, Birinci, and Kurt in 2012 (see Appendix C). A 5-point scale was used for the measurement including 33 items. The Cronbach's alpha coefficient of the scale was measured as .95 (Kabakçı-Yurdakul et al., 2012). Additionally, the result of the present study yielded that the coefficient of TPACK was .91. This score is also quite high, thus this scale is consistent with the present study.

There have been certain studies in the related literature about Technological Pedagogical Content Knowledge measuring various components including Content Knowledge (CK), Pedagogical Knowledge (PK), Technological Knowledge (TK), Pedagogical Content Knowledge (PCK), Technological Content Knowledge (TCK), Technological Pedagogical Knowledge (TPK), and Technological Pedagogical Content Knowledge (TPACK) individually. However, this poses an obstacle for the philosophy of TPACK. TPACK should be evaluated taking into consideration the collective components together (Kabakçı-Yurdakul, Odabaşı, Kılıçer, Çoklar, Birinci, and Kurt 2012; Kabakçı-Yurdakul and Çoklar, 2014).

The reason for choosing the TPACK-Deep Scale is that the instrument makes it possible to measure and investigate pre-service EFL teachers' TPACK competences together as a different property from the other measurements of TPACK (Kabakçı-Yurdakul et al. 2012).

3.3.3. Open-ended questions

The open-ended questions included 7 structured questions intended to reveal the opinions of participants related to the influence of technological pedagogical content knowledge on three subscales of teacher efficacy. Based on the studies in the aforementioned literature, the questions were formed by the researcher in order to reveal how and to what extent they can integrate technology into English teaching practices in terms of considering teacher efficacy. Furthermore, the open-ended questions had the final forms after making necessary adjustments based on view of two experts in EFL Teaching (see Appendix D).

The questions were asked to the all participants in English with the understanding that they would be an English teacher in the next term and would have proficient English to answer the questions. The first question aimed to reveal participants' preferences related to technology use in order to develop their English teaching skills. After that, the second and third questions were related to relationship between student engagement and teaching with technology. The second question investigated whether teaching English with technology had an effect on students' motivation for learning English. The third question was as to whether technology influences their students' opinions. The fourth question was about classroom management sub-scale and investigates whether participants used technology as a way for controlling class. Following this, the fifth and sixth questions were related to link between instructional strategies and technology use in teaching. The fifth question addressed what types of in-class evaluation they provided through technology in teaching English. The sixth question focused on contribution of technology in their instructions, questions, and teaching methods. The last question was about the importance of technology for teaching English. Participants were asked to explain all these questions based on their experiences of practice teaching sharing their own examples.

3.4. Data Collection Procedures

The researcher applied to the Institute of Educational Sciences of Anadolu University for permission firstly, the necessary legal permissions were gathered. After obtaining the necessary permission for all the universities aforementioned, the study was carried out in all indicated universities (see Appendix E). Furthermore, permission of the researchers who developed ETSES and TPACK-Deep Scale was also given to use these scales in the current study via e-mail (see Appendix F). At the beginning of the data collection process, purpose of the study was explained to all participants. It was promised that their responses would be confidential, and they could get out of the participation whenever they wished.

The study was conducted in the last semester of teacher education program in the university. The reason for administering it at that time was to allow for EFL pre-service teachers to have as much experience in English language teaching as possible and to have completed nearly all of the theoretical courses in order to respond questions depending on both their theoretical and practical knowledge. The data collection instrument was handed out to the participants in the classroom environment. All pre-service teachers were expected to complete all parts in the instruments accompanied with an instructor. After data collection period, the qualitative data were evaluated in conjunction with the results of quantitative data.

3.5. Analytical Procedures

This study mixing quantitative and qualitative data was designed as "Data Triangulation". Thus, quantitative data results were supported with qualitative data.

Quantitative data collected through Teachers' Background Questionnaire, TPACK-Deep Scale, and English Teachers' Sense of Efficacy Scale were analysed using statistical techniques. Descriptive statistics were conducted in the study. Grounded on pre-service teachers' responses to the first part of the instrument related to participants' personal information, frequencies, and percentages were computed in order to obtain data related to their experiences with technology for educational purposes. Additionally, mean scores and standard deviations, correlation analysis, and bivariate regression methods were calculated for both ETSES and TPACK. Furthermore, reliability levels for both ETSES and TPACK-Deep Scales were also measured by the Cronbach's alpha coefficient in order to see to their levels of reliability in the context of the present study.

Qualitative analysis was also used to examine the relationship between Turkish EFL pre-service teachers' sense of efficacy and their TPACK. Open-ended questions were analysed through constant comparison method (Dye, Schatz, Rosenberg, and Coleman, 2000). Goetz and LeCompte (1981) explained that constant comparison method as an integration of inductive category coding with comparison of social events at the same time; thus, new relations can be detected by comparing these events with the ones identified before. For the current study, it is important to make possible categories to match the data collected through open-ended questions. Participants' responses to the open-ended questions were analysed, and some categories were identified according to their responses. After that, the categories were used to form themes.

The whole qualitative data set was analyzed by two raters working at the same university. One of these raters was the researcher of the current study, and the other one was an experienced instructor. The analysis was carried out by these raters independently. As a way to assess interrater reliability, percentage of agreement was measured in order to determine degree of consistency between the raters. The result indicated that interrater reliability was 90% (Huck, 2008).

3.6. Summary

The methodology of the current study has been explained in this chapter. Table 2 gives outline of the present study including research questions, the related instruments and data analysis.

Table 2. *Outline of the Research Questions, Related Instruments and Data Analysis*

Research Question	Instruments	Data Analysis
1. What are the levels of Turkish EFL pre-service teachers' perceptions of teacher efficacy?	ESTES Scale	Reliability Analysis, Descriptive Statistics
2. What are the levels of Turkish EFL pre-service teachers' perceptions of TPACK competences?	TPACK Scale	Reliability Analysis, Descriptive Statistics
3. What is the relationship between Turkish EFL pre-service teachers' perceptions of TPACK competences and overall teacher efficacy and its subscales?	ESTES Scale, TPACK Scale, Open-ended Questions	Correlation Analysis, Bivariate Regression, Constant Comparison Method

CHAPTER 4

RESULTS AND DISCUSSION

4.1. Introduction

The purpose of this chapter is to present the results of both quantitative and qualitative data collected through (1) English Teachers' Sense of Efficacy Scale (ETSES), (2) TPACK-Deep Scale, and (3) Open-Ended Questions. Following the results, the outcomes will be discussed.

In the first part of this chapter, the reliability levels of scales were demonstrated. In the second part, findings related to three research questions were analysed. For the first research question, the pre-service teachers' perceptions of teacher efficacy were assessed with regards of its sub-scales. For the second question, their perceptions of TPACK were evaluated, and the variations of their technology use in terms of language skills, reasons during the lesson preparation, and plans for future classes were assessed. As the last question, whether there is a relationship between their perceptions of teacher efficacy and TPACK competences was revealed. In the final part, the outcomes of the study were discussed.

4.2. Reliability of ETSES and TPACK-Deep Scale

Reliability of both scales was evaluated by Cronbach's alpha coefficient. For ETSES, Cronbach's alpha coefficients were calculated for the total scale and sub-scales grounded on the data gathered from the whole participants. Internal consistency results demonstrated that the coefficient of "Student Engagement" sub-scale was .738, "Classroom Management" was .845, "Instructional Strategies" was .700, and the coefficient for the total scale was .877. The coefficients of "Classroom Management" and total scale indicated a strong internal consistency, and the coefficients of “Student Engagement” and “Instructional Strategies” were acceptable (Huck, 2008).

For TPACK, Cronbach’s alpha coefficients were measured for the scale based on the data obtained from all participants. Internal consistency results demonstrated that the coefficient for the scale was .905. The coefficient of the scale indicated a strong internal consistency (Huck, 2008).

4.3. Findings Related to the Research Questions

The findings of both quantitative with qualitative data are evaluated together in the order of research questions.

4.3.1. Levels of Turkish EFL pre-service teachers’ perceptions of teacher efficacy

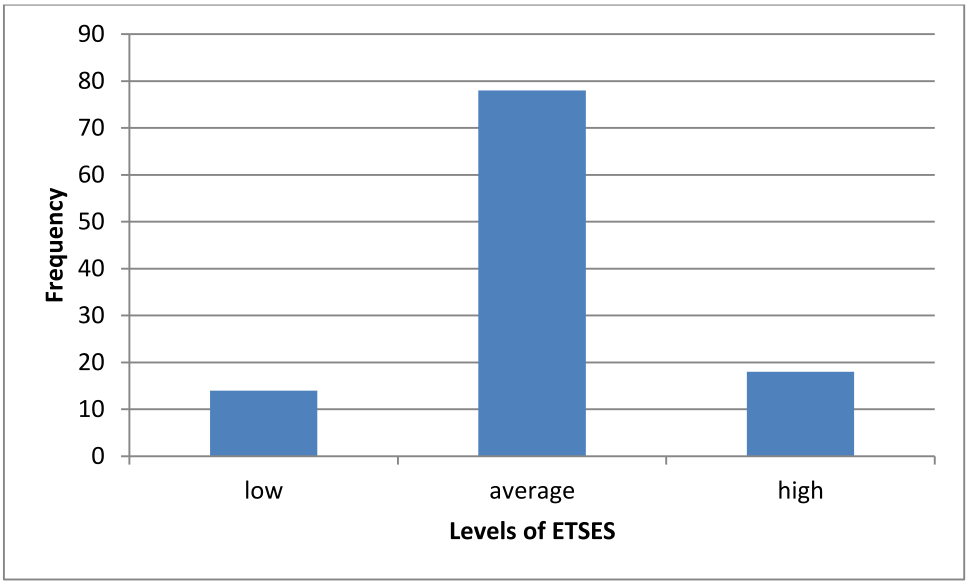
ESTES Scale was used to find out the participants’ levels of overall teacher efficacy perceptions in four universities. Table 3 shows mean and standard deviation of overall ETSES.

Table 3. *Mean Score and Standard Deviation of Overall ETSES*

	N	**Lowest Score**	**Highest Score**	***M***	***SD***
ETSES Scale	110	52	108	84.24	10.485

It can be seen in Table 3 that mean score of EFL pre-service teachers’ perceptions of teacher efficacy was 84.24. While the highest score was 108, the lowest score was 52.

Based on the data collected through ETSES, three groups were detected and they are low, average, and high efficacy groups indicating the pre-service teachers’ levels of efficacy. As the standard deviation was assumed to correspond to one level, the scores between one level below and above the mean score were assigned to "average efficacy group". The scores lower than the scores in average efficacy group were classified as "low efficacy group", and the scores higher were grouped as "high efficacy group" demonstrated in Graph 1 (Aydın, 1999).



Graph 1. *Distribution of the Pre-service Teachers' Efficacy Scores*

As seen in Graph 1, the highest number of pre-service teachers among these three groups is 78 in "average efficacy group". The scores of teachers in the average group are between 73.5 and 94.5. Additionally, in "low efficacy group", there are 14 pre-service teachers whose scores vary between 52 and 73.5. Lastly, the number of pre-service teachers is 18 in "high group" whose scores change between 94.5 and 108. The results obtained from ETSES indicate that most of the participants have moderate levels of teacher efficacy in the current study. However, it should be emphasized that mean score of overall ETSES is high, so, they had high levels of overall teacher efficacy.

4.3.1.1. The EFL pre-service teachers' perceptions of teacher efficacy levels for "Student Engagement", "Classroom Management", and "Instructional Strategies"

ESTES Scale was also used to reveal the levels of EFL pre-service teachers' efficacy perception regarding students' involvement in EFL learning, management in EFL classes, and applying EFL instructional strategies in their teaching experiments.

Table 4. *Mean Scores and Standard Deviations of ETSES Scale (For Sub-scales)*

Items	**N**	**Mean**	**SD**
Student engagement	**110**	**27.67**	**4.217**
1		7.06	
2		7.25	
3		7.15	
4		6.20	
Classroom management	**110**	**27.89**	**4.409**
5		6.67	
6		7.28	
7		6.97	
8		6.96	
Instructional strategies	**110**	**28.67**	**3.700**
9		7.18	
10		7.35	
11		6.95	
12		7.18	

As it is demonstrated in Table 4, pre-service teachers reported having high levels of self-efficacy in "Instructional Strategies" most (*M*=28.67), then in "Classroom Management" (*M*=27.89), and finally in "Student Engagement" (*M*=27.67). It can be said that pre-service teachers had the highest difficulty in student engagement, then classroom management, and lowest in instructional strategies.

As for “Student engagement”, the pre-service teachers had the highest mean score for item 2 in this sub-scale. This means that they perceive themselves as more efficacious in getting students’ believe for their success in learning English. However, they had the lowest score for item 4 which refers that they did not consider themselves so effective in helping families for their children’s success as the other items of “Student engagement”.

Concerning “Classroom management”, the participants reported to have the highest mean score for item 6 which indicates that they consider having the highest performance in getting students obey the rules in the classroom. Apart from this, mean scores of other items of the sub-scale were close to one another. This signifies a high level of perception for the participants’ skills of classroom management.

With respect to “Instructional strategies”, it was revealed that the pre-service teachers rated the highest score for item 10. Namely, they had a greater level of efficacy perceptions in providing various explanations in points when students had difficulty to understand. The mean scores of the items were not also different very much, but item 11 related to their ability to ask good questions had the lowest level.

4.3.2. Levels of Turkish EFL pre-service teachers’ perceptions of TPACK competences

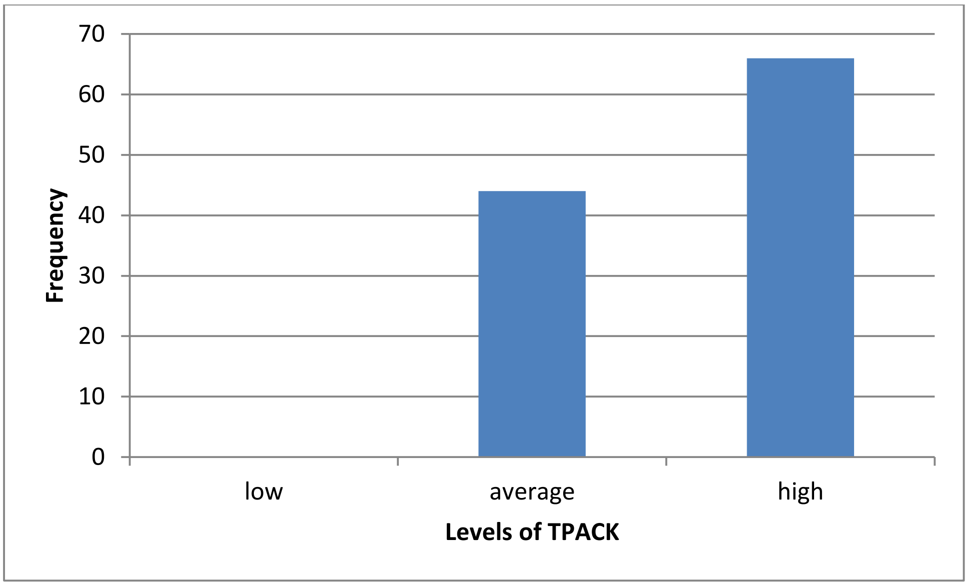
TPACK-Deep Scale was used to reveal the levels of EFL pre-teachers’ perceptions of TPACK competences in various university environments. Table 5 indicates the mean score of overall TPACK-Deep Scale.

Table 5. *Mean Score and Standard Deviation of Overall TPACK-Deep Scale*

	N	**Lowest Score**	**Highest Score**	***M***	***SD***
TPACK-Deep Scale	110	106	165	134.29	12.633

Table 5 shows that mean score was found 134.29 over 165, and this demonstrates participants' high level of perception in TPACK. The highest score was 165 while the lowest one was 106.

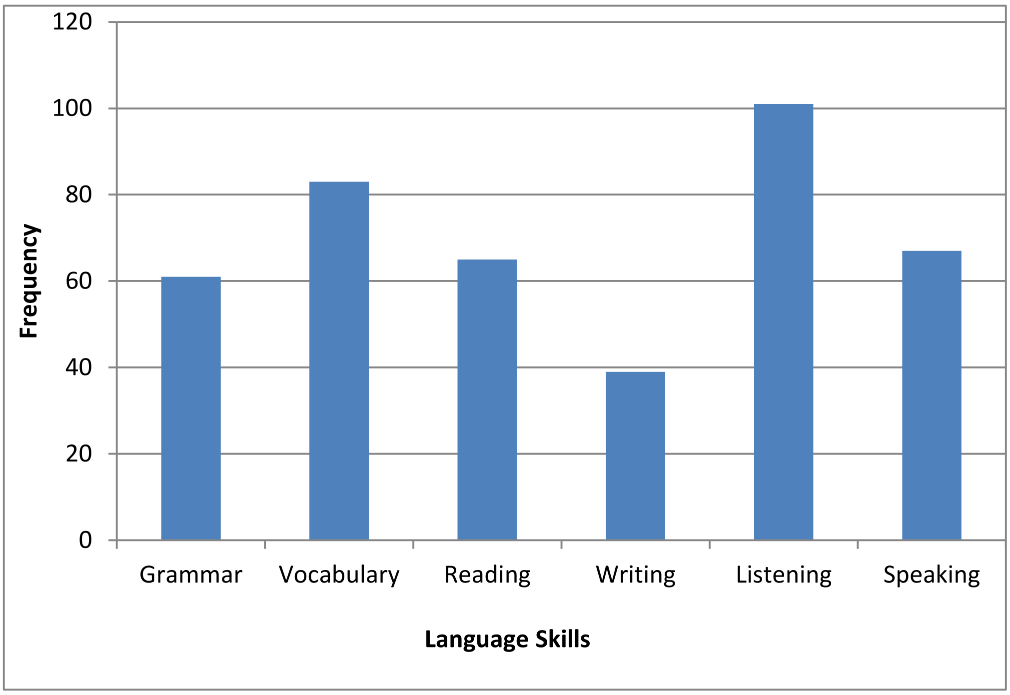
According to the assessment criteria of TPACK-Deep Survey determined by Kabakçı-Yurdakul et al. (2012), the participants' total scores that are equal to and lower than 95 are evaluated to have "low level of TPACK"; scores between 96 and 130, and equal to 130 are "average level of TPACK"; and, the ones that are higher than 130 are "high level of TPACK". The results are presented in Graph 2 below;



Graph 2. *Distribution of the Pre-service Teachers' TPACK Scores*

As seen in Graph 2, there is not any score detected lower than 95; that is, none of the participants is in the group of "low level of TPACK". The lowest score gathered from the study is 106. There are 44 participants detected to have "average level of TPACK". The number of participants whose level of TPACK considered as high is 66, and the highest score obtained in the present study is 165.

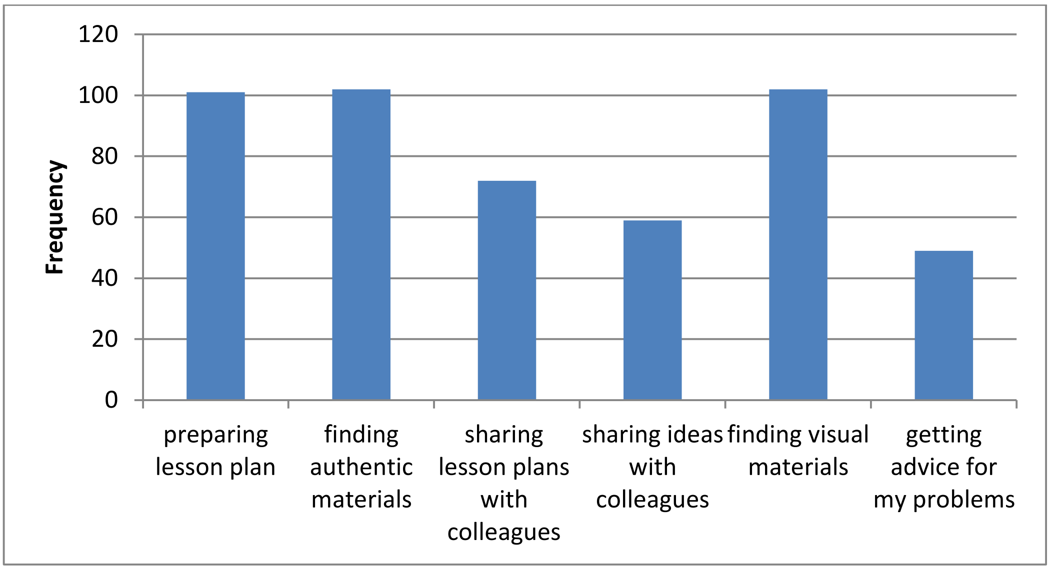
As the qualitative data analysis revealed the participants use technology in order to develop their students' grammar, vocabulary, reading, writing, listening and speaking abilities in language teaching classroom shown in Graph 3.



Graph 3. *Technology Use for Various Language Skills*

As seen in Graph 3, the pre-service teachers prefer to use technology for different skills in varying rates. They use technology most for listening activities among all other language skills. One hundred and one (91.8%) participants use technology for listening activities, eighty-three (75.4%) for vocabulary activities, sixty-seven (60.9%) for speaking activities, sixty-five (59%) for reading activities, sixty-one (55.4%) for grammar activities, and thirty-nine (35.4%) for writing activities in English language classroom.

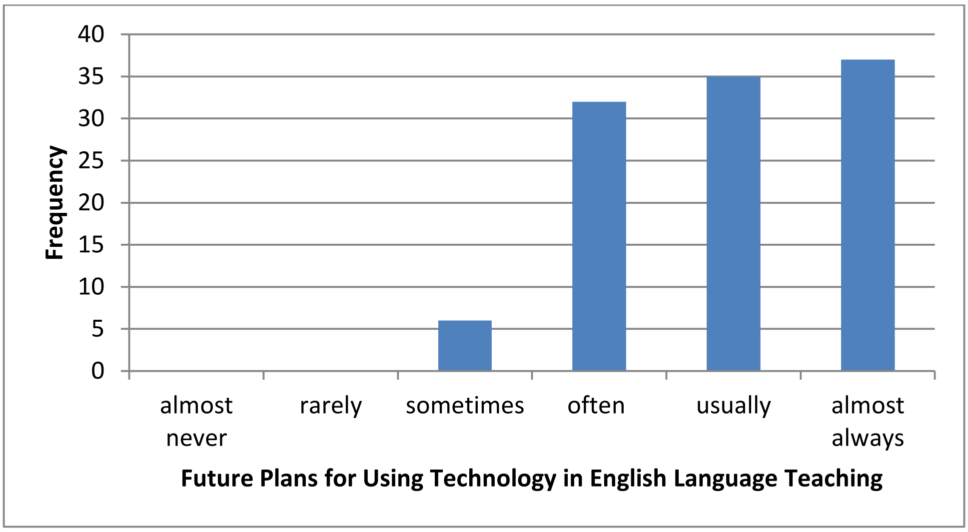
Qualitative data collected from the background questionnaire also reveals pre-service teachers use technology for various reasons while preparing the lesson. The reasons and their frequencies are presented in Graph 4.



Graph 4. *Reasons for Technology Use during the Lesson Preparation*

As it is clear in Graph 4, the pre-service teachers use technology for various reasons during the lesson preparation. One hundred and two (92.7%) participants use technology for finding authentic and visual materials, and one hundred and one (91.8%) for the preparation of lesson plan, seventy-two (65.4%) for sharing their lesson plans, fifty-nine (53.6%) for sharing their ideas with their colleagues, and forty-nine (44.5%) for getting advice from their colleagues. In parallel with the quantitative results, qualitative data analysis indicated that most of the participants reported to use technology in listening, vocabulary, and, speaking activities, and also, some of them in grammar, reading and writing activities in language classroom.

The plans of the ELT pre-service teachers related to technology use in the future is another crucial point obtained from the qualitative data analysis. Their future plans for technology use in language teaching are presented in Graph 5.



Graph 5. *Future Plans for Using Technology in English Language Teaching*

Graph 5 gives the frequencies of the pre-service teachers' plans for using technology in language classes in the future. Thirty-seven (33.6%) participants reported to use technology as "almost always" in language teaching in the future, thirty-five (31.8%) as "usually", thirty-two (29.1%) as "often", and five (4.5%) as "sometimes". It is clear that all of the participants stated to use technology for language teaching in varying levels.

4.3.3. Relationship between Turkish EFL pre-service teachers' perceptions of overall teacher efficacy and its sub-scales, and TPACK competences

The present study aims to investigate whether there is a relationship between Turkish EFL pre-service teachers' perceptions of TPACK competences and teacher efficacy, also sub-scales of teacher efficacy. All quantitative and qualitative tools aforementioned were used to explore the relationship among these variables. Table 6 shows the correlation matrix of the relationship between the participants' perceptions of teacher efficacy and TPACK competences in the present study.

Table 6. *Inter-correlations between the participants' perceptions of teacher efficacy and TPACK competences*

	ETSES	TPACK
ETSES	-	.321**
TPACK		-

**Correlation is significant at the 0.01 level

As it is seen in Table 6, there is a significant moderate positive relationship between teacher efficacy and TPACK competence (r=.321, p<.01). This result indicates that the pre-service teachers who get higher scores from TPACK tend to get higher scores from teacher efficacy, or vice versa.

Table 7 presents the results of regression analysis between dependent variable of "ETSES" and independent variable of "TPACK" whose contribution in explaining the variance in the dependent variable was explored.

Table 7. *Regression Analysis (Dependent Variable: ETSES)*

Model	R	R Square	Adjusted R Square	Standard Error	F Model	R Square Change	F Change
TPACK	.321	.103	.095	.83139	12.400	.103	12.400*

*. F is significant at the 0.05 level

As it can be seen in Table 7, the R square of this regression model was found .103, and it is significant at the .05 level. This means that TPACK scores of EFL pre-service teachers explain 10.3% of the variance in the dependent variable.

Correlations among the participants' perceptions of TPACK competences and sub-scales of teacher efficacy were also investigated. The results of the correlation analysis are demonstrated in Table 8.

Table 8. *Inter-correlations between the Participants' Perceptions of TPACK Competences and Sub-Scales of Teacher Efficacy*

	TPACK	Student Engagement	Classroom Management	Instructional Strategies
TPACK	-	.323**	.234*	.262**
Student Engagement		-	.564**	.621**
Classroom Management			-	.573**
Instructional Strategies				-

**Correlation is significant at the 0.01 level
*Correlation is significant at the 0.05 level

Table 8 demonstrates the correlation matrix of the variables in the present study. There is a significant moderate positive relationship between TPACK competence and student engagement scores (r=.323, p<.01). This result indicates that pre-service teachers who get higher scores from TPACK tend to get higher scores from student engagement, or vice versa. Furthermore, there is a significant positive relationship between TPACK competence and classroom management scores (r=.234, p<.05). Moreover, there is a significant positive relationship between TPACK competence and instructional strategies scores (r=.262, p<.01).

Further analysis was conducted in order to determine unique contribution of each sub-scale of teacher efficacy through regression analysis. Table 9 shows the regression analysis between pre-service teachers' levels of student engagement and TPACK competences.

Table 9. *Regression Analysis (Dependent Variable: Student Engagement)*

Model	R	R Square	Adjusted R Square	Standard Error	F Model	R Square Change	F Change
TPACK	.323	.105	.096	1.00219	12.610	.105	12.610*

*. F is significant at the 0.01 level

Table 9 indicates the results of regression analysis between dependent variable of "Student Engagement" and independent variable of "TPACK" whose contribution in explaining the variance in the dependent variable was explored. As it can be seen in this table, the R square of this regression model was found .105, and it is significant at the .01 level. This means that TPACK scores of EFL pre-service teachers explain 10.5% of the variance in student engagement.

The analysis of the questionnaire and open-ended questions indicated particular aspects that are important to reveal the relationship among student engagement and TPACK. The first aspect revealed is that most of the participants (85%) believe the influence of technology use on students' motivation to learn English. They explained that using technology in language classes improves learners' all abilities with a wide variety of tools and authentic materials. One of the pre-service teachers expressed her opinion based on teaching experiment as follows:

> *I think using technology has an influence on students' motivation to learn English. For example, when students have lessons with PowerPoint slides, they become more motivated instead of just showing pictures in my hand* (Participant 23).

Another extract from response of one open-ended question explained how technology has an effect on students' motivation to learn English:

> *We live in a time that everyone has something to do with teaching technology. Even the babies who are one or two years old are playing with smart phones not with the toys. So, the only tool we can use to motivate our students is technology* (Participant 25).

Change in the learners' opinions related to language abilities is another aspect emerged from the qualitative data analysis. Almost all participants (91%) reported to believe that technology use in language classes influences learners' opinion about their abilities to do better in English positively. The common perception of the participants is that there is a positive relationship between technology use and learners opinions on performing better in English. Based on their teaching practice, the pre-service teachers illustrated this situation with the following two extracts:

> *I think using technology in learning affects learners' opinions related to their abilities to better in English. Visuals can improve to recall vocabulary. When I use it, they say "it is very good to learn vocabulary"* (Participant 33).

> *Using technology in language has a positive influence on students' opinions. Students' abilities will improve and they will be surprised how they have better performances. They say they can do better in reading and writing while I am teaching via e-mail and chatting* (Participant 37).

Another common point emerged from the qualitative data analysis is that using technology makes language teaching easier and faster. Many participants (55%) told that students pay attention and want to participate in lesson more when teachers integrate technology into their courses. As a consequence, they considered that students can improve language learning by the help of technology use in language classes.

Table 10 presented below shows the results of regression analysis between participants' classroom management and TPACK competences.

Table 10**.** *Regression Analysis (Dependent Variable: Classroom Management)*

Model	R	R Square	Adjusted R Square	Standard Error	F Model	R Square Change	F Change
TPACK	.234	.055	.046	1.07642	6.284	.055	6.284*

*. F is significant at the 0.05 level

Table 10 shows the results of regression analysis between dependent variable of “Classroom Management” and independent variable of “TPACK” whose contribution in explaining the variance in the dependent variable was explored. R square of this regression model was found .055, and it is significant at the .05 level. This means that TPACK scores of EFL pre-service teachers explain 5.5% of the variance in classroom management.

Qualitative data analysis revealed that most of the pre-service teachers (64%) prefer to use technology as a way of classroom management. One of the participants clarified this with her experience in teaching as follows:

> *It is easier to manage the class while using technology. Especially when you are using smart-boards, you do not have to turn your back to the students* (Participant 53).

Additionally, another participant put an emphasis on a different point in terms of classroom management:

> *I prefer to use technology as a way of managing the classroom because we won’t spend time for showing picture and want them to concentrate on topic. We won’t spend time to write anything and they could not find any time to speak someone else or to be interested in anything* (Participant 28).

The participants who reported not to use technology as a way of managing the classroom claimed that classroom management is not related to technology integration but it depends on other things:

> *I do not prefer technology is a way of classroom management. Teachers’ own existence in the class, his voice, books control the class, but not technology* (Participant 48).

While using technology, it is harder because while you are dealing with technology students can go out of control (Participant 50).

The details of regression analysis between participants' instructional strategies and TPACK are given in Table 11.

Table 11. *Regression Analysis (Dependent Variable: Instructional Strategies)*

Model	R	R Square	Adjusted R Square	Standard Error	F Model	R Square Change	F Change
TPACK	.262	.068	.060	.89693	7.930	.068	7.930*

*. F is significant at the 0.01 level

Table 11 reveals the results of regression analysis between dependent variable of "Instructional Strategies" and independent variable of "TPACK" whose contribution in explaining the variance in the dependent variable was explored. R square of this regression model was found .068, and it is significant at the .01 level. This means that TPACK scores of EFL pre-service teachers explain 6.8 % of the variance in instructional strategies.

The analysis of the questionnaire and open-ended questions indicated particular points that are important to display the relationship among instructional strategies and TPACK. One of these points is "in-class evaluation". Some of the pre-service teachers (40%) thought that technology is a good way to provide different sorts of in-class evaluation in their language classes. The participants recommended various activities that can be applied for evaluating learners' comprehension during the lesson such as listening, watching, speaking, and pronunciation exercises. A suggestion of a pre-service teacher was as follows:

Technology maintains various comprehension check activities in the lesson. Wikis can be an example for some writing tasks, and teacher can

> *simultaneously check their progress allowing them to give feedback when necessary* (Participant 1).

The other participants expressed that they have not tried to use technology for in-class evaluation. Some of those participants gave the impression of being uncertainty depending on their answers such as “I am not sure about using technology for evaluation in the class”, or “I do not think technology provides assessment in the lesson”. Some others showed their lack in teaching experience as the reason for not using technology for this.

Applying different methods for teaching English is another crucial point emerged from the qualitative data analysis. Half of the pre-service teachers reported that using technology in language classroom contributes to their teaching methods. The responses given for the open-ended questions indicated that a common idea shared by most of the participants that technology integration is useful for performing communicative activities in English language teaching. Furthermore, a considerable number of participants (65%) declared the impact of technology use in language classes on maintaining instructions in a more efficacious way. They stated that developing technology suggests a variety of tools they can use in different ways in the language classroom. One of the pre-service teachers expresses her idea on this issue as the following:

> *Of course, technology has an influence on teachers’ instructions. For example, rather than simply putting the instructions into words, I can now show what I really mean via projector or interactive screen. Interactive screen also allows us to write notes, answers on pdf files which we generally use for questions* (Participant 1).

4.4. Discussion

In this study, the aims were to investigate (a) perceptions of Turkish pre-service teachers of English language related to their overall teacher efficacy and the sub-scales of teacher efficacy, (b) level of their TPACK competences, and (c) the relationship between TPACK competences and teacher efficacy of Turkish pre-service teachers of English language.

First, this study revealed the levels of Turkish EFL pre-service teachers' perceptions of teacher efficacy. The participants of the study were given ETSES (Chacon, 2005) in order to find their levels of teacher efficacy. Results of the descriptive statistics showed that the participants have scores ranging between 52 and 108, and the mean score is 84.24 over 108. These findings demonstrated that the participants of the present study have high levels of teacher efficacy in English language teaching. The findings of the study are congruent with the findings of other studies (Fortman and Pontius, 2000; Tunç-Yüksel, 2010; Pendergast, Garvis, and Keogh, 2011; Temiz and Topcu, 2013; Bilali, 2013). The reasons for this result can be that they were all senior year students and had teaching practices in practicum schools, and they believed in their competences in teaching English.

Following this, the participants' levels of teacher efficacy subscales were detected examining the results of ETSES. The outcomes indicated that the participants assessed themselves as more efficacious in "instructional strategies" as compared to "student engagement" and "classroom management". The finding of the study supports the findings of other researchers (Chacon, 2005; Temiz and Topcu, 2013; Bilali, 2013). This finding of the present study is crucial because as Bandura (1997) states:

> Teachers who believe strongly in their instructional efficacy tend to rely on persuasory means rather than authoritarian control and to support development of their students' intrinsic interest and academic self-directedness (p. 241).

There are some other studies which also indicated teachers' highest levels of efficacy in "Classroom management" (Tunç-Yüksel, 2010), and in "Student Engagement" (Pendergast, Garvis, and Keogh, 2011). This shows that the ultimate level of efficacy may differ among these sub-scales in various teaching contexts.

After displaying the results related to levels of EFL pre-service overall teachers' efficacy and its sub-scales, the current study also aimed to explore their TPACK level. The participants were given TPACK-Deep Scale (Kabakçı-Yurdakul et al., 2012) to reveal their levels of TPACK. The results of the study demonstrated that participants have high scores ranging between 106 and 165, and the mean of total scale score is 134.29. The results of the current study were compared with the findings of the other studies that TPACK-Deep Scale was used in. As a consequence, it was detected that the results of the present study show similarity with the outcomes of all these studies (Kabakçı-Yurdakul, 2011; Ceylan, Türk, Yaman, and Kabakçı-Yurdakul, 2014). At this point, TPACK-Deep Scale is seen important for the educational development of pre-service teachers as Kabakçı-Yurdakul et al. (2012) pointed out:

> TPACK-deep scale may allow questioning and developing teacher training in terms of technology integration, thus allows determining the TPACK levels of preservice teachers during the teacher training process. Applied research could be conducted to help preservice teachers gain the necessary knowledge and skills regarding educational technology integration (p.974).

On the other hand, a difference was detected between the results of the present study and Uygun's study (2013). The outcomes of Uygun's study pointed out that all participants have high level of TPACK with respect to the assessment criteria of TPACK-Deep Survey determined by Kabakçı-Yurdakul et al. (2012). However, the present study revealed that a group of the pre-service teachers' scores were in "high level of TPACK" (N=66), and the others were in "average level of TPACK" (N=44). In Uygun's study, participants' scores increased after the implementation of learning by design module that consisted of TPACK activities. Likewise, moderate level of pre-service teachers' TPACK knowledge in the current study can be increased with the support of courses based on TPACK.

In the present study, qualitative data analysis revealed that all of the pre-service teachers agree on the importance of technology for English language teaching. They reported that technology has become a part of their teaching in spite of their lack of courses for using technology in English language teaching. They used technology most in listening activities in the classroom, and finding authentic and visual materials during the preparation of the lesson. The role of technology in language teaching can be emphasized with the help of an interesting example extracted from the pre-service teachers' responses to the open-ended questions:

> *Teaching a language is very different from teaching any other major. It doesn't have boundaries, without the help of technology we can't find any new and original ideas for our teaching process. We have to find a wide variety of sources, materials and activities when we're teaching a foreign language and using technology is the best way to make this happen* (Participant 15)

Although all the pre-service teachers agreed on the importance of technology use in English language teaching, they expressed varying levels for using technology in teaching in the future. One of the possible reasons for this result is the condition of school environment illustrated in the response of one pre-service teacher:

> *If it is up to me, of course, I prefer to use technologies. However, there is no even projector in the schools that I've gone. Moreover, in some class there is not even magnetic board. I use internet for various materials and visual games. I want them have fun while learning. For this purpose, I use internet sites like eltplanets, eslkids, and so on* (Participants 21).

Correspondingly, one participant who had wishes to integrate technology in her teaching in Niess's study (2005) expressed that her ideas about technology integration can only be valid in a school environment supporting the integration. Similarly, Littrell, Zagumny, and Zagumny (2005) put an emphasis on the importance of accession to technology in the classroom. However, possessing the essential technological tools cannot be seen as a solution for technology integration at all schools. There are a wide range of reasons for this situation as explained in various studies such as not having knowledge, abilities, or competencies to use technology in the classroom (Keiper, Harwood and Larson, 2000; Belland, 2009), organizational, administrative, pedagogical, or personal constraints (Leh, 2005), teachers' beliefs related to educational technology and their ability to successfully integrate it (Ertmer, 2005; Brinkerhoff, 2006; Park and Ertmer, 2007).

The main aim of the current study was to investigate the relationship among the relationship between Turkish EFL pre-service teachers' perceptions of overall teacher efficacy and three sub-scales of teacher efficacy, and TPACK competences. A significant moderate positive relationship was detected between overall teacher efficacy and TPACK competence ($r = .321$, $p < .01$). This result pointed that the pre-service teachers who have higher scores from TPACK tend to get higher scores from teacher efficacy. Following this, it was revealed that TPACK scores of EFL pre-service teachers explain 10.3 % of the variance in the overall teacher efficacy. This finding showed TPACK has an influence on the pre-service teachers' perception of teacher efficacy. This finding of the study conforms to the outcomes of Sahin et al. (2009) who concluded that a significant relationship was detected among the pre-service teachers' vocational self-efficacy beliefs that refer to teacher efficacy and their varying levels of knowledge in content, pedagogy, and technology. Additionally, the same study exhibited that pre-service teachers who have high scores in content, pedagogy, and technology knowledge bases reported to have vocational self-efficacy beliefs. It was emphasized in their study that it is expected to increase pre-service teachers' efficacy beliefs for their jobs providing the knowledge of content, pedagogy, and technology at the same time in the framework of teacher education programs (Sahin et al., 2009). Furthermore, Abbitt (2011) supported this finding of the current study stating that an increase in pre-service teachers' technology, pedagogical content, and technological pedagogical knowledge caused an increase in levels of their self-efficacy perceptions.

Another result of the study pointed that a significant moderate positive relationship was also found between TPACK competence and student engagement scores (*r*=.323, *p*<.01). This result indicates that pre-service teachers who have higher scores from TPACK can engage students' better in the classroom. Afterwards, it was concluded that TPACK scores of EFL pre-service teachers explain 10.5% of the variance in student engagement. This finding demonstrated the influence of TPACK on the pre-service teachers' student engagement. Niess (2005) supports the finding of current study with the statements of one participant of the participants in this study:

> Technology was integral to mathematics and thus to learning mathematics. She looked for ways to incorporate technology as she planned her instructional strategies. With this desire to incorporate technology, she taught her technology sequence early in the fulltime student teaching ... By the end of the student teaching experience, she had been able to engage her students as active learners of mathematics (p.519).

The majority of the pre-service teachers (85%) expressed that integrating technology into language class has an effect on the students' motivation to learn English. This finding of the study shows a parallelism with the finding of Niess (2005). One participant of Niess's study (2005) yielded that technology use as a part of their lesson can increase students' motivation and boost their learning.

In the present study, a great majority of participants (91%) believed that technology use in language classes has an influence on learners' opinion about their abilities to get better results in English language learning. That is to say that positive relationship between technology use and learners opinions on performing better in English was emphasized. One outcome of Başaran and Cabaroğlu's study (2014) supports this finding of the present study indicating that it is possible to change beliefs of some learners to the positive way by means of innovative technology. One of the findings gathered in Başaran's another study (2010) shows similarity with this finding of the current study. In that study, Başaran examined the influence of podcasts on learning beliefs of pre-service teachers in terms of all language skills, and the results pointed out that using podcasts influenced their beliefs related to English language learning.

Some of the participants (55%) stated that students pay attention and want to participate in lesson more as teachers integrate technology with their content areas as a result of present study; so, using technology makes language teaching easier and faster. One participant in Niess's study (2005) shared similar ideas depending on his teaching experience related to a particular subject in their field that students might not comprehend the subject appropriately without using technology and technology supports their learning and gives them courage to learn the subject at a higher level.

Another outcome of this study yielded that there is a significant positive relationship between TPACK competence and classroom management scores (r=.234, p<.05). Following this, it was found that TPACK scores of EFL pre-service teachers explain 5.5% of the variance in classroom management. This finding showed the extent of influence of TPACK on classroom management. Qualitative data analysis demonstrated that a group of the pre-service teachers (64%) reported to use technology as a way to manage the class in the current study.

Furthermore, results of the current study also indicated that there is a significant positive relationship between TPACK competence and instructional strategies scores (r=.262, p<.01). After this, it was revealed that TPACK scores of EFL pre-service teachers explain 6.8% of the variance in instructional strategies.

Zhao (2003) supports these findings of the present study related to both classroom management and instructional strategies with the explanation that:

> Instead of threading technology knowledge as a separate entity of teacher knowledge, I suggest that we view it as an integrated part of teacher pedagogical knowledge and pedagogical content knowledge. In other words, technology becomes an element of instructional and classroom management strategies. Knowledge of teaching, learning, and content includes knowledge of technology (p.8).

On the other hand, the participants declared not to use technology for classroom management emphasized the reasons for this situation as having difficulty in controlling the class when trying to use technology in lesson and choosing other ways to manage class. Thus, it is possible to interpret as they do not feel very relaxed in using technology for controlling the classroom. Similarly, Niess (2005) concluded that one participant of the study preferred to talk and explain the subject in the classroom without using technology due to feeling more comfortable.

The results of qualitative analysis showed that some of the pre-service teachers (40%) thought that technology is a good way to provide different sorts of in-class evaluation in their language classes. From the same point of view, Beatty and Gerace (2009) illustrated a technology based assessment system that provides teachers to ask questions, students' response to these questions, and software collects and demonstrates their responses in a graph during the lesson. The example explained in the study of Beatty and Gerace (2009) requires a quite complex technological system. However, classroom assessment can also be maintained with a simple system. Spanos, Hansen, and Daines (2001) explain some techniques that teachers can project students' works and prepare and show some graphics, or they can use chat rooms or texts for oral communication during the lesson. Thus, classroom assessment of students' work can be sustained with a simple or a complicated system depending on the conditions of schools.

Most of the participants (65%) declared the impact of technology use in language classes on maintaining instructions in a more efficacious way. This finding of the study shows a parallelism with an outcome of Niess's study (2005). According to one participant of that study, learners can understand the topics and concepts in their field more effectively as compared to the traditional ways, illustrating with one of her teaching experience:

> There are many different probes that plug right into computers in the classroom… But it is not used as much as it could, or as effectively as it could be…it would be wise to have [these probes] available during labs (even if they are only an option) (p. 515).

As a consequence, the outcomes of the present study indicate that TPACK has an influence on Turkish EFL pre-service overall teacher efficacy, and student engagement, classroom management, and instructional strategies in varying levels. This study is the first step to understand TPACK in ELT contexts and develop an awareness of preparing teacher candidates for teaching integrating technology. These results determined the effect of technology on teachers' beliefs about their effectiveness and readiness for teaching profession at the end of undergraduate period among the pre-service teachers in English Language Teaching Departments of four universities in Turkey.

The aim of this study is to reveal the effect of TPACK on teacher efficacy and its three sub-scales. However, it is considered the relationship between teacher efficacy and TPACK is not unidirectional, as exemplified in Abbitt's study (2011):

> The TPACK framework suggests that integrated knowledge of technology, pedagogy, and content is an essential condition to effective and innovative classroom teaching using technology. Further, self-efficacy beliefs regarding abilities to integrate technology into teaching are also considered a factor influencing decisions a teacher would make about the use of technology in the classroom (p.137).

Furthermore, Sahin et al. (2009) concluded that pre-service teachers' self-efficacy levels in teaching probably show an increase when they are provided content, pedagogy, and technology knowledge as a whole. Supporting the complexity of this situation, it was suggested to conduct further studies in order to clarify the relationship between them (Sahin et al., 2009). Thus, there is a need for further investigation into the relationship between TPACK and teacher efficacy in two-way.

The results of the present study demonstrated that TPACK has an influence on the EFL pre-service teachers' efficacy perceptions (10.3%). There are other factors affecting their teacher efficacy indicated in the following studies: peer coaching (Göker, 2006); pre-service teachers' awareness of teaching abilities, opinions related to teaching and learning, experience with cooperating teacher, classroom practices, and school practices (Atay, 2007); mentors' behaviour and abilities (Pekkanli-Egel, 2009); metacognitive awareness, and academic achievement (Alcı and Yüksel, 2012); and critical thinking disposition (Yüksel and Alcı, 2012).

4.5. Summary

This chapter has demonstrated the analysis of the data gathered with the help of the Teachers' Background Questionnaire, TPACK-Deep Scale Kabakçı-Yurdakul et al. (2012), English Teachers' Sense of Efficacy Scale (ETSES) (Chacon, 2005), and Open-Ended Questions. Reliability analysis, descriptive statistics, correlation analysis, bivariate regression, and constant comparison method were assessed in order to reveal the outcomes about the level of TPACK and ETSES of the pre-service teachers, and the relationship between their TPACK and teacher efficacy.

Consequently, quantitative data analysis demonstrated that a meaningful relationship was detected between their levels of TPACK and overall ETSES, TPACK and student engagement, TPACK and overall classroom management, and TPACK and instructional strategies, respectively.

Qualitative data analysis also supported the findings of quantitative data. The details of qualitative data analysis are given in Table 12.

Table 12. *Results of Qualitative Data Analysis*

Technology use has an effect on…	**%**
Influencing learners' opinions for achieving better language learning outcomes	91
Improving learners' motivation to learn English	85
Presenting instructions more efficaciously	65
Managing the learners in class	64
Making language learning easier and faster	55
Providing a variety of assessment options during the class-time	40

As seen in Table 12, it was indicated that technology integration has an effect on influencing learners' opinions for achieving better language learning outcomes (91%), improving learners' motivation to learn English (85%), presenting instructions more efficaciously (65%), managing the learners in class (64%), making language learning easier and faster (55%), and providing a variety of assessment options during the class-time (40%). Moreover, the results of the present study were discussed with the findings of the studies in related literature.

The following chapter gives details of the conclusions, implications for

English Language Teaching, and recommendations for further studies.

CHAPTER 5

CONCLUSIONS AND IMPLICATIONS

5.1. Summary

There have been numerous studies on the impact of technology on various fields in educational context. Depending on the developments in this area, a new term According to the Turkish Education Association, “Technological Pedagogical Content Knowledge” (TPACK) was explained as “having knowledge about the integration of technology with curriculum and subject area, how to teach it and its’ relationship with the other disciplines recent developments in the subject area, its basic concepts, instruments, structures and content” (TED, 2009, pp. xix-xx).

Koehler and Mishra (2008) elucidated a TPACK model pinpointing the knowledge of different technological tools for specific fields that require teachers to integrate it into their subject areas in an effective way. According to this TPACK model, there are three main components as content, pedagogy and technology. Technology integration points out the necessary technology, curriculum, pedagogy, abilities of teachers, and organizational and economical preparedness (Tinio, 2003).

From educational point of view, it is possible to explain that technology integration into courses refers using available tools and materials for the purpose of developing learning (Okojie, Olinzock, and Okojie-Boulder, 2006). Moreover, Margerum-Leys and Marx (2002) argued that it is vital to understand the role of technology in teaching and the influence of technology on teachers’ beliefs seeing as the developments in technology (as cited in Sahin, Akturk, and Schmidt, 2009). The relationship between pre-service teachers’ TPACK and teacher efficacy has been discussed in many studies (Niess, 2005; Sahin, Akturk, and Schmidt, 2009; Erdogan and Sahin, 2010; and Abbitt, 2011). However, the researcher of the present study has not found a study in the literature related to the relationship among Turkish EFL pre-service teachers' efficacy beliefs and their TPACK knowledge.

The purpose of the present study was to explore the relationship between TPACK and teacher efficacy of Turkish pre-service teachers of English language. The first step was to reveal the perceptions of Turkish pre-service teachers of English language related to their overall teacher efficacy and its sub-scales that are student engagement, classroom management, and instructional strategies. The second step was to find out the level of their Technological Pedagogical Content Knowledge (TPACK). As a consequence, the relationship between their TPACK knowledge and teacher efficacy beliefs was revealed.

In order to reach these aims, 110 senior year students at the Department of English Language Teaching in Anadolu, Marmara, Yeditepe, and Yıldız Technical Universities took part in the study. The research tools of the study included (a) Questions related to teachers' background for obtaining data about demographic information of the participants and understanding of their technology use better; (b) TPACK-Deep Scale for identifying the levels of their TPACK; (c) ETSES for finding out the levels of their overall teacher efficacy and its sub-scales; and (d) Open-ended Questions for confirming and reinforcing the relationship detected through the data obtained from TPACK-Deep and ETSES. The participants were given all the research tools together.

In the process of data analysis, descriptive statistics were carried out in order to reveal levels of their TPACK and ETSES. Additionally, the study also demonstrated pre-service teachers' having courses for technology use in English language teaching, technology for various skills, reasons for technology use during lesson preparation process, and their future plans for using technology in ELT. Following this, correlation analyses were conducted to detect the relationship among TPACK and ETSES, and TPACK and its sub-scales. Depending on these results, bivariate regressions were measured determining TPACK as independent variable in order to see its effects on ETSES and its sub-scales that were dependent variable one by one. As the last step, constant comparison method was applied in order to confirm and reinforce the results of quantitative data obtained in the study. Thus, the results have shed light on the influence of TPACK on Turkish EFL pre-service teachers' efficacy perceptions.

5.2. Conclusions

There are three research questions in the current study as follows: (1) What are the levels of Turkish EFL pre-service teachers' perceptions of overall teacher efficacy and three sub-scales as follows: student engagement, classroom management, and instructional strategies? (2) What are the levels of Turkish EFL pre-service teachers' perceptions of TPACK competences? (3) What is the relationship between Turkish EFL pre-service teachers' perceptions of TPACK competences and overall teacher efficacy, and its subscales?

The first research question examined levels of Turkish EFL pre-service teachers' perceptions of teacher efficacy and these three sub-scales. The findings suggested that the group of participants in the study reported to have high levels of overall teacher efficacy. Investigating the variations in three sub-scales of teacher efficacy, it was revealed that pre-service teachers evaluated their instructional strategies better than their student engagement and classroom management strategies. This outcome concurs the Chacon's finding (2005).

The second research question investigated levels of Turkish EFL pre-service teachers' perceptions of TPACK competences. The participants declared to have high levels of TPACK knowledge at the end of their undergraduate educational period. While most of the participants were in the group of "high" level of TPACK, the others were in the "average" group. Furthermore, nobody declared having "low" level of TPACK. Additionally, qualitative data analysis revealed that all participants agreed on the importance of technology in education, and they used it for different purposes for both lesson preparation and in-class activities.

For the last research question, the relationships among Turkish EFL pre-service teachers' perceptions of overall teacher efficacy and its sub-scales, and TPACK competences were determined. Correlation analysis demonstrated a meaningful relationship between overall teacher efficacy and TPACK competence. This finding denotes that pre-service teachers who would like to have higher efficacy beliefs should have higher levels of TPACK. In this sense, this outcome of the study is in agreement with the results of other studies in the literature (Sahin et al., 2009; Abbitt, 2011).

In relation to "Student Engagement", significant relationship was found between TPACK competence and student engagement. According to the results of qualitative data analysis, students had higher levels of motivation when pre-service teachers used technology in language classes. Furthermore, another impact of technology integration into language classes was observed in students' opinions towards achieving better language learning outcomes. As a result of these effects, the participants concluded that students learned in an easier and faster way with the aid of technology.

In reference to "Classroom Management", a significant relationship was detected with TPACK competence. Results obtained from the qualitative data analysis concur with this result. However, a group of pre-service teachers expressed not using technology for language teaching, and for the reason of not feeling relaxed in controlling the class while using technology.

In respect to the third sub-scale "Instructional Strategies", a meaningful relationship was found between TPACK competence and instructional strategies. According to the outcomes gathered from qualitative data, participants expressed that technology integration has a greater influence on providing a variety of ways for assessment when they need to clarify a point during the class-time. Additionally, they also believed to present instructions more efficaciously as they used technology.

In conclusion, the findings of the current study indicated that Turkish EFL pre-service teachers' TPACK has an influence on not only their overall teacher efficacy perceptions but also its sub-scales of student engagement, classroom management, and instructional strategies. These results have raised the concern about the role of TPACK in the preparation of teacher candidates.

5.3. Implications

The findings of the present study suggest both empirical and practical implications for educators and educational researchers. The results of the current study have shed light on the effect of Turkish EFL pre-service teachers' TPACK on their efficacy beliefs. The outcomes of the study revealed that TPACK increased their perceptions of overall teacher efficacy, and beliefs on student engagement, classroom management, and instructional strategies separately as well. These results imply the requirement of pre-service teachers' TPACK development in order to improve their teacher efficacy.

As emphasized in many parts of the present study, there is an intertwined relationship among the components of TPACK. It is possible to develop content, pedagogical, and technological knowledge during the teacher preparation program. Maintaining various experiences of technology integration at different stages can result in a more complex and intensive comprehension of the interaction among these components and pre-service teachers' skills of using technology efficaciously in teaching (Abbitt, 2011). All members of the teacher education program should be informed about the role of TPACK on pre-service teachers' efficacy perceptions and for better results in English language teaching.

Educational institutions should take into consideration the relationship among the content, pedagogy and technology as important and beneficial. The educational planners and managers have the duty of planning curricula and learning environment with the purpose of assisting pre-service teachers in gaining knowledge relevant to technology and pedagogy in their fields (Sahin et al., 2009). Concordantly, faculty members in English Language Teaching Departments should be aware of the results of the current study that pre-service teachers use technology in both lesson preparation period and classroom activities for the reason that:

> Teachers who learn about technology from a content perspective may be more likely to use it to support content learning, whereas teachers who learn it as a skill may have greater difficulty using the technology for educative purposes (Hughes, 2005, p. 280)

They should provide department courses in such a way to improve all these components simultaneously. Development of a more multiplex structure of technology in perspectives of pre-service teacher accompanies with the advancement of their needs for the reinforcing technology skills. In this way, pre-service teachers can more wisely identify appropriate technology skills for the field, and they probably use it in their class hereafter (Abbitt, 2011).

The probability of pre-service teachers use technology and pedagogy future increases on the condition that they observe and experience the integration of suitable educational technologies in their subject areas when they are students (Sahin et al., 2009). This refers to the close link between students' experiences in their educational period and technology integration in teaching. Faculty members have responsibilities for providing various opportunities for technology integration as they attain their objectives of content and pedagogy. The responsibility of faculty members is important in pre-service teachers' application of educational technology. They should be models for pre-service teachers' improvement of TPACK components. Additionally, faculty members should help pre-service teachers to improve particular links among TPACK components (Sahin et al., 2009; Hughes, 2004). Thus, various opportunities should be provided for students to observe and use technology as much as possible during the courses they attend at university and also encouraged to integrate technology into their teaching practices.

However, another crucial point to be considered carefully that the development of a subtle comprehension of the relationship among content, pedagogy, and technology should be in accordance with particular context strategies and representation for quality teaching. That is to say "there is no single technological solution that applies for every teacher, every course, or every view of teaching" (Koehler, Mishra, Hershey, and Peruski, 2004, p. 31). Every language class has its own characteristics, and pre-service teachers should be aware of this situation. They should know the success and abilities of the student group in one class, and also the dynamism of that classroom in order to choose the best technological tools for that classroom.

For education planners and managers, being aware of pre-service teachers' TPACK levels is important in order to improve these levels, thus, to meet the needs of modern teaching environments. The education planners and managers should find ways to develop these three components of TPACK. Furthermore, developing their TPACK in teacher training programmes will probably increase their teacher efficacy. Consequently, language teachers will be more efficacious, and language education will also be more effective.

5.4. Suggestions for Further Research

This study was carried out in four universities with 110 Turkish EFL pre-service teachers in Turkey. Thus, it is not possible to generalize the outcomes of this study for the all Turkish EFL settings. However, this study can be seen as the first step to reveal the relationship between teacher efficacy and Technological Pedagogical Content Knowledge in Turkish EFL pre-service settings. Therefore, the same study could be conducted with more participants in various teaching training settings. Moreover, it might be beneficial to collect data in an extended period observing pre-service teachers during classroom practices.

The participants of this study were pre-service EFL teachers from various universities in Turkey. Furthermore, it would be interesting to carry out a study in order to detect the in-service teachers' levels of TPACK, teacher efficacy, and to reveal whether there is an influence of their TPACK levels on teacher efficacy. Especially, this study would demonstrate in-service teachers' TPACK levels which could provide more suggestions for both in-service training programs and pre-service teacher education programs.

In a recent article, Abbitt (2011) asserts that TPACK is necessary for efficient and innovative educational environment when they teach using technology. Furthermore, it was also suggested that teachers' efficacy beliefs in regard to the competences to use technology in teaching have an influence on their technology integration in classroom. Therefore, further study could be conducted to reveal the impact of teacher efficacy on TPACK.

As mentioned earlier in this study, there are some factors detected to influence teacher efficacy. However, there may be others that have an effect on teacher efficacy. Thus, there is a need for further studies to discover new elements. Furthermore, TPACK is a quite new issue in the literature, and possible factors should also be studied in further research.

APPENDICES

APPENDIX A

Dear Students,

I am conducting a study for my master's thesis titled as "The Relationship between Teacher Efficacy and Technological Pedagogical Content Knowledge within the Scope of EFL Pre-Service Teachers".

For my study, I would like to study with fourth-grade students in the Department of English Language Teaching. The study aims to investigate perceptions of Turkish pre-service teachers of English language related to their overall teacher efficacy and its sub-scales, level of their Technological Pedagogical Content Knowledge (TPACK), and the relationship between TPACK and teacher efficacy of Turkish pre-service teachers of English language. The participation is voluntary, and your answers will be kept confidentially. You can leave the study whenever you want.

Thank you.

Manolya Tunçer
Graduate Student
Department of English Language Teaching
Anadolu University

Teacher's Background Information

I. Demographic Information

a. Age:

b. Gender:

( ) Female ( ) Male

c. Name of the University:____

II. Personal experiences related to technology use

a. Do you have your own computer?

( ) Yes ( ) No

b. Do you have a smart phone?

( ) Yes ( ) No

c. How often do you use Internet?

( ) Almost never ( ) Rarely ( ) Sometimes

( ) Often ( ) Usually ( ) Almost always

III. Educational background related to technology use

a. Have you had any training for technology use?

( ) Yes ( ) No

b. If your answer is "yes" for question "a",

i. How many courses have you had for using technology to teach English?

ii. What sorts of courses have you had?

IV. Teaching experiences related to technology use

a. How many hours have you taught in practice teaching?

( ) No experience ( ) Between 1 -3 hours ( ) Between 4-6 hours

( ) Between 7-9 hours ( ) 10 hours or above

b. How often do you use technology for teaching?

( ) Almost never ( ) Rarely ( ) Sometimes

( ) Often ( ) Usually ( ) Almost always

c. I use technology to teach (you can choose more than one option)

( ) Grammar ( ) Vocabulary ( ) Reading

( ) Writing ( ) Listening ( ) Speaking

d. I use technology (you can choose more than one option)

( ) to prepare lesson plan ( ) to find authentic materials

( ) to share my lesson plans with my colleagues ( ) to share ideas with my colleagues

( ) to use visual materials in my classes ( ) to motivate my students

( ) to get advice from my colleagues for my problems

( ) other purposes:

____

____

____

____

e. How often will you use technology in your class in the future?

( ) Almost never ( ) Rarely ( ) Sometimes

( ) Often ( ) Usually ( ) Almost always

f. What technological tools do you plan to use while teaching or practicing various language skills? (Please explain the appropriate tools for each teaching objective individually)

-

-

-

g. If your answer is “Almost never” or “Rarely” for question “d”, what are your reasons for not using technology in your class?

-

-

-

APPENDIX B

English Teachers' Sense of Efficacy Scale

This questionnaire is designed to help us a better understanding of the kinds of things that create difficulties for teachers in their school activities. Please indicate your opinion about each of the statements below. Your answers are confidential.

(1) Nothing (3) Very little (5) Some Influence (7) Quite a bit (9) A great deal

1. How much can you do to motivate the students who show low interest in learning English?

   1 2 3 4 5 6 7 8 9

2. How much can you do to get students believe they can do well in English?

   1 2 3 4 5 6 7 8 9

3. How much can you do to help your students' value learning English?

   1 2 3 4 5 6 7 8 9

4. How much can you assist families in helping their children do well in school?

   1 2 3 4 5 6 7 8 9

5. How much can you do to control disruptive behaviour in the classroom?

   1 2 3 4 5 6 7 8 9

6. How much can you do to get students follow classroom rules in your English classroom?

   1 2 3 4 5 6 7 8 9

7. How much can you do to calm a student who is disruptive or noisy in your English class?

   1 2 3 4 5 6 7 8 9

8. How well can you establish a classroom management system with each group of students?

   1 2 3 4 5 6 7 8 9

9. How much can you use a variety of assessment strategies in your English class?

   1 2 3 4 5 6 7 8 9

10. To what extent can you provide an alternative explanation or example when your (English) students are confused?

    1 2 3 4 5 6 7 8 9

11. To what extent can you craft good questions for your students?

    1 2 3 4 5 6 7 8 9

12. How well can you implement alternative strategies in your English classroom?

    1 2 3 4 5 6 7 8 9

APPENDIX C

TPACK-Deep Scale

The purpose of this section is to gather information about combining technology, pedagogy and content knowledge in the teaching and learning process. For each item, choose **only one option** (Strongly Disagree, Disagree, Neither Agree or Disagree, Agree, Strongly Agree) that best describes you. Please answer all of the questions and if you are uncertain of or neutral about your response you may always select "Neither Agree or Disagree"		Strongly Disagree	Disagree	Neither Agree or Disagree	Agree	Strongly Agree
1	I can update an instructional material (paper based, electronic or multimedia materials, etc.) based on the needs (students, environment, duration, etc.) by using technology.	❑	❑	❑	❑	❑
2	I can use technology to determine students' needs related to a content area in the pre-teaching process	❑	❑	❑	❑	❑
3	I can use technology to develop activities based on student needs to enrich the teaching and learning process.	❑	❑	❑	❑	❑
4	I can plan the teaching and learning process according to available technological resources.	❑	❑	❑	❑	❑
5	I can conduct a needs analysis for technologies to be used in the teaching and learning process to increase the quality of teaching.	❑	❑	❑	❑	❑
6	I can optimize the duration of the lesson by using technologies (educational software, virtual labs, etc.).	❑	❑	❑	❑	❑
7	I can develop appropriate assessment tools by using technology.	❑	❑	❑	❑	❑
8	I can combine appropriate methods, techniques and technologies by evaluating their attributes in order to present the content effectively.	❑	❑	❑	❑	❑
9	I can use technology to appropriately design materials to the needs for an effective teaching and learning process.	❑	❑	❑	❑	❑
10	I can organize the educational environment in an appropriate way to use technology.	❑	❑	❑	❑	❑
11	I can implement effective classroom management in the teaching and learning process in which technology is used	❑	❑	❑	❑	❑
12	I can assess whether students have the appropriate content knowledge by using technology.	❑	❑	❑	❑	❑
13	I can apply instructional approaches and methods appropriate to individual differences with the help of technology.	❑	❑	❑	❑	❑
14	I can use technology for implementing educational activities such as homework, projects, etc.	❑	❑	❑	❑	❑
15	I can use technology based communication tools (blog, forum, chat, e-mail, etc.) in the teaching process.	❑	❑	❑	❑	❑
16	I can use technology for evaluating students' achievement in related content areas.	❑	❑	❑	❑	❑
17	I can be an appropriate model for the students in following codes of ethics for the use of technology in my teaching.	❑	❑	❑	❑	❑
18	I can guide students in the process of designing technology based products (presentations, games, films, and etc.).	❑	❑	❑	❑	❑
19	I can use innovative technologies (Facebook, blogs, twitter, podcasting, etc.) to support the teaching and learning process.	❑	❑	❑	❑	❑
20	I can use technology to update my knowledge and skills in the area that I will teach.	❑	❑	❑	❑	❑
21	I can update my technological knowledge for the teaching process.	❑	❑	❑	❑	❑
22	I can use technology to keep my content knowledge updated.	❑	❑	❑	❑	❑
23	I can provide each student equal access to technology.	❑	❑	❑	❑	❑
24	I can behave ethically in acquiring and using special/private information – which will be used in teaching a subject area - via technology (audio records,	❑	❑	❑	❑	❑

	The purpose of this section is to gather information about combining technology, pedagogy and content knowledge in the teaching and learning process. For each item, choose **only one option** (Strongly Disagree, Disagree, Neither Agree or Disagree, Agree, Strongly Agree) that best describes you. Please answer all of the questions and if you are uncertain of or neutral about your response you may always select "Neither Agree or Disagree"	Strongly Disagree	Disagree	Neither Agree or Disagree	Agree	Strongly Agree
	video records, documents and etc.)					
25	I can use technology in every phase of the teaching and learning process by considering the copyright issues (e.g. license)	❑	❑	❑	❑	❑
26	I can follow the teaching profession's codes of ethics in online educational environments (WebCT, Moodle, etc.).	❑	❑	❑	❑	❑
27	I can provide guidance to students by leading them to valid and reliable digital sources.	❑	❑	❑	❑	❑
28	I can behave ethically regarding the appropriate use of technology in educational environments.	❑	❑	❑	❑	❑
29	I can troubleshoot problems that could be encountered with online educational environments (WebCT, Moodle, etc.)	❑	❑	❑	❑	❑
30	I can troubleshoot any kind of problem that may occur while using technology in any phase of the teaching-learning process	❑	❑	❑	❑	❑
31	I can use technology to find solutions to problems (structuring, updating and relating the content to real life, etc.).	❑	❑	❑	❑	❑
32	I can become a leader in spreading the use of technological innovations in my future teaching community.	❑	❑	❑	❑	❑
33	I can cooperate with other disciplines regarding the use of technology to solve problems encountered in the process of presenting content.	❑	❑	❑	❑	❑

APPENDIX D

Open-ended Questions

In this part, please write your answers based on your experiences of practice teaching.

1. Do you prefer to use technology in order to improve your English teaching skills? If your answer is "yes", please give examples.

2. a) Do you think using technology has an influence on students' motivation to learn English?
   b) Have you ever detected such an influence of technology integration on students' motivation in your teaching experience?

3. a) Do you think using technology in learning affects learners' opinions related to their abilities to do better in English?
   b) Have you ever observed such a change in your students' ideas with the integration of technology in your teaching experience?

4. Do you prefer to use technology as a way of managing your classroom such as controlling disruptive behaviours, or making students calm for a better learning environment?

5. Do you think technology has provided different sorts of in-class evaluation in your English class? Please give examples from your teaching experience.

6. Does technology contribute to your instruction, questions, or teaching methods? Please give examples from your teaching experience.

7. How would you explain the importance of technology for teaching English in your class?

APPENDIX E

T.C.
ANADOLU ÜNİVERSİTESİ REKTÖRLÜĞÜ
Genel Sekreterlik

Sayı : 63784619-399-560 26./05/2014

Konu :

EĞİTİM BİLİMLERİ ENSTİTÜSÜ MÜDÜRLÜĞÜNE

İlgi : Eğitim Bilimleri Enstitüsü Müdürlüğünün 16.04.2014 tarihli ve 500-126 sayılı yazısı.

Enstitünüz Yabancı Diller Eğitimi Anabilim Dalı İngilizce Öğretmenliği Yüksek Lisans programı öğrencisi Manolya TUNÇER, "Türk İngilizce Öğretmen Adaylarının Teknolojik Pedagojik Alan Bilgileri İle Öz Yeterlilikleri Arasındaki İlişki" başlıklı yüksek lisans tezini hazırlamaktadır. Tez çalışması uygulamasını, Üniversitemiz Eğitim Fakültesi İngilizce Öğretmenliği son sınıf (4. Sınıf) öğrencileri ile gerçekleştirmesi Rektörlüğümüzce uygun görülmüştür.

Bilgilerinizi rica ederim.

Prof. Dr. Aydın AYBAR
Rektör a.
Rektör Yardımcısı

DAĞITIM:

Gereği:	Bilgi:
Eğitim Bilimleri Enstitüsü Müdürlüğüne	Eğitim Fakültesi Dekanlığına

26.05.2014
1115

- Danışmana
- İlgiliye
- 26.05.2014

APPENDIX F

Gmail by Google

Manolya Tunçer <manolyatuncer@gmail.com>

İzin TPACK-Deep Scale

3 messages

Manolya Tunçer <manolyatuncer@gmail.com> Tue, May 13, 2014 at 11:25 PM
To: isilk@anadolu.edu.tr, isilk@iastate.edu

Sayın Işıl Hocam,

Anadolu Üniversitesi, İngilizce Öğretmenliği Yüksek Lisans öğrencisiyim. Doç. Dr. Belgin AYDIN tarafından yürütülmekte olan yüksek lisans tez çalışmam kapsamında 2012 yılında "The development, validity and reliability of TPACK-deep: A technological pedagogical content knowledge scale" isimli çalışmanızda geliştirmiş olduğunuz TPACK-Deep Scale izninizle kullanmak istiyorum.

Saygılarımla,

Manolya TUNÇER

Anadolu Üniversitesi

Işıl KABAKÇI YURDAKUL <isilk@anadolu.edu.tr> Wed, May 14, 2014 at 8:45 PM
To: Manolya Tunçer <manolyatuncer@gmail.com>

Merhaba Manolya, TPACK-deep ölçeğini yüksek lisans tezin kapsamında kullanabilirsin. Ben de çalışmanın sonuçlarını heyecanla bekliyor olacağım. Belgin hocaya da kocaman selamlar. Çalışmalarında kolaylıklar, başarılar..

Doç.Dr. Işıl Kabakçı Yurdakul
Anadolu Üniversitesi
Eğitim Fakültesi, BÖTE Bölümü
Eskişehir, TÜRKİYE

Işıl Kabakçı Yurdakul, PhD
Department of Computer Education and
Instructional Technologies
College of Education
Anadolu University, TURKEY

Kimden: Manolya Tunçer [manolyatuncer@gmail.com]
Gönderildi: 13 Mayıs 2014 Salı 23:25
Kime: Işıl KABAKÇI YURDAKUL; isilk@iastate.edu
Konu: İzin TPACK-Deep Scale

[Quoted text hidden]

Manolya Tunçer <manolyatuncer@gmail.com> Thu, May 15, 2014 at 1:28 PM
To: Işıl KABAKÇI YURDAKUL <isilk@anadolu.edu.tr>

Çok teşekkür ederim hocam.
Selamınızı Belgin hocama ileteceğim ve umarım en kısa sürede sonuçları sizinle paylaşacağım.

Saygılarımla

2014-05-14 20:45 GMT+03:00 Işıl KABAKÇI YURDAKUL <isilk@anadolu.edu.tr>:
[Quoted text hidden]

Gmail by Google

Manolya Tunçer <manolyatuncer@gmail.com>

Permission for "Teacher Sense of Efficacy Scale"

Manolya Tunçer <manolyatuncer@gmail.com> Tue, May 13, 2014 at 11:23 PM
To: mxtsch@wm.edu

Dear Sir/Madam,

I am a postgraduate student at the Department of English Language Teaching in Anadolu University, Eskişehir in Turkey. I would like to use the short version of the scale called as "Teacher Sense of Efficacy Scale" developed by Megan Tschannen-Moran and Anita Woolfolk

Hoy, and adapted by Carmen Teresa Chaco´ n for EFL context. Could you allow me to use your instrument in my M.A. thesis?

Sincerely,

Manolya TUNÇER

Anadolu University, TURKEY

Gmail by Google

Manolya Tuncer <manolyatuncer@gmail.com>

Permission for "Teacher Sense of Efficacy Scale"

Megan Tschannen-Moran <mxtsch@wm.edu> Wed, May 14, 2014 at 5:58 PM
To: Manolya Tunçer <manolyatuncer@gmail.com>

Davis, Here's a request for a translated version,

Sent from my Sprint phone.
[Quoted text hidden]

Gmail by Google

Manolya Tuncer <manolyatuncer@gmail.com>

Permissions Letter

1 message

Davis Clement <dclement@email.wm.edu> Mon, Jun 2, 2014 at 7:05 PM
To: manolyatuncer@gmail.com

Manolya,

I have attached a letter of permission from Dr. Tschannen-Moran, as well as directions for accessing the materials on her password-protected research site.

Please let me know if you have any further questions.

Regards,

D

Davis Clement
Graduate Assistant, School of Education
The College of William & Mary
104 Flintlock Rd.
Williamsburg, VA 23187

2 attachments

Manolya Tuncer.pdf
72K

MTMGuest instructions.pdf
658K

The College Of
WILLIAM&MARY

School of Education
P.O. Box 8795
Williamsburg, Virginia 23187-8795
Fax: (757) 221-2988

Megan Tschannen-Moran, Ph.D.
Professor of Educational Policy, Planning, and Leadership
mxtsch@wm.edu
(757) 221-2187

June 2, 2014

Manolya,

You have my permission to use either or both Turkish translations of the Teacher Sense of Efficacy Scale (formerly called the Ohio State Teacher Sense of Efficacy Scale), which I developed with Anita Woolfolk Hoy, in your research. You can find a copy of the measure and scoring directions on my web site at http://wmpeople.wm.edu/site/page/mxtsch . Please use the following as the proper citation:

Tschannen-Moran, M & Hoy, A. W. (2001). Teacher efficacy: Capturing an elusive construct. *Teaching and Teacher Education, 17*, 783-805.

I will also attach directions you can follow to access my password protected web site, where you can find the supporting references for this measure as well as other articles I have written on this and related topics.

I would love to receive a brief summary of your results.

All the best,

Megan Tschannen-Moran
The College of William and Mary
School of Education

REFERENCES

Abbitt, J. T. (2011). An investigation of the relationship between self-efficacy beliefs about technology integration and technological pedagogical content knowledge (TPACK) among preservice teachers. *Journal of Digital Learning in Teacher Education*, *27*(4), 134-143.

Adair-Hauck, B., Willingham-McLain, L., & Youngs, B. E. (1999). Evaluating the integration of technology and second language learning. *CALICO Journal*, *17*(2), 269-306.

Akkuzu, N., & Akcay, H. (2012). Examination of the Self-Efficacy Beliefs of Prospective Chemistry Teachers in Terms of Different Variables (the Sample of Dokuz Eylul University). *Educational Sciences: Theory and Practice*, *12*(3), 2208-2216.

Alcı, B., & Yüksel, B. (2012). An Examination Into Self-Efficacy, Metacognition and Academic Performance of Pre-Service ELT Students: Prediction and Difference. *Kalem Eğitim ve İnsan Bilimleri Dergisi, 2* (1), 143-165.

Angeli, C., & Valanides, N. (2005). Preservice elementary teachers as information and communication technology designers: an instructional systems design model based on an expanded view of pedagogical content knowledge. *Journal of Computer Assisted Learning*, *21*(4), 292-302.

Angeli, C., & Valanides, N. (2009). Epistemological and methodological issues for the conceptualization, development, and assessment of ICT–TPCK: Advances in technological pedagogical content knowledge (TPCK). *Computers & Education*, *52*(1), 154-168.

Archambault, L. M., & Barnett, J. H. (2010). Revisiting technological pedagogical content knowledge: Exploring the TPACK framework. *Computers & Education*, *55*(4), 1656-1662.

Archambault, L., & Crippen, K. (2009). Examining TPACK among K-12 online distance educators in the United States. *Contemporary Issues in Technology and Teacher Education*, *9*(1), 71-88.

Armor, D., Conry-Oseguera, P., Cox, M., King, N., McDonnell, L., Pascal, A., Pauly, E. & Zellman, G. (1976). *Analysis of the school preferred reading programs in selected Los Angeles minority schools* (Rep. No. R-2007-LAUSD). Santa Monica, CA:RAND.

Atay, D. (2007). Beginning teacher efficacy and the practicum in an EFL context. *Teacher Development*, *11*(2), 203-219.

Aydın, B. (1999). *A study of the sources of foreign language classroom anxiety in speaking and writing classes.* Doctoral Thesis. Anadolu University, Eskişehir, Turkey.

Aydın, S., & Boz, Y. (2010). Pre-service elementary science teachers' science teaching efficacy beliefs and their sources. *Elementary Education Online*, *9*(2), 694-704.

Bandura, A. (1971). Social learning theory. New York: General Learning Press.

Bandura, A. (1977). Self-efficacy: toward a unifying theory of behavioral change. *Psychological review*, *84*(2), 191-215.

Bandura, A. (1982). Self-efficacy mechanism in human agency. *American Psychologist*, *37*(2), 122-147.

Bandura, A. (1989). Social cognitive theory. In R. Vasta (Ed.), Annals of child development. Vol.6. Six theories of child development (pp. 1-60). Greenwich, CT: JAI Press.

Bandura, A. (1994). Self-efficacy. In V. S. Ramachaudran (Ed.), Encyclopedia of humanbehavior. Vol. 4 (pp. 71-81). New York: Academic Press.

Bandura, A. (Ed.). (1995). *Self-efficacy in changing societies*. Cambridge University Press.

Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: W.H. Freeman and Company.

Bandura, A. (undated). *Teacher self-efficacy scale.* Retrieved 17 April, 2014, from http://people.ehe.osu.edu/ahoy/files/2009/02/bandura-instr.pdf.

Başaran, S. (2010). *Effects of podcasts on language learning beliefs and self-efficacy perceptions of first-year Turkish university students.* Doctoral Thesis. Çukurova University, Adana, Turkey.

Başaran, S. & Cabaroğlu, N. (2014). Language Learning Podcasts and Learners’

Beliefs Change. *The Electronic Journal for English as a Second Language,* 17(4).

Bataineh, R. F. & Abdel-Rahman, A. A. (2006). Jordanian EFL students' perceptions of their computer literacy: An exploratory case study. *International Journal of Education and Development using ICT*, 2(2). Retrieved 20 May, 2014, from http://ijedict.dec.uwi.edu//viewarticle.php?id=169&layout=html.

Beatty, I. D., & Gerace, W. J. (2009). Technology-enhanced formative assessment: A research-based pedagogy for teaching science with classroom response technology. *Journal of Science Education and Technology*, *18*(2), 146-162.

Belland, B. R. (2009). Using the theory of habitus to move beyond the study of barriers to technology integration. *Computers & Education*, *52*(2), 353-364.

Berman, P., McLaughlin, M. W., Bass-Golod, G. V., Pauly, E., & Zellman, G. L. (1977). Federal programs supporting educational change: Vol. VII, Factors affecting implementation and continuation (Report No. R-1589/7-HEW). Santa Monica, CA: Rand Corporation.

Bilali, O. (2013). Teaching Efficacy to Student Teachers in the Faculty of Education. *Journal of Educational and Social Research*, *3*(1), 179-185.

Bodzin, A. M. (1999). *Purposeful Use of a Non-Restrictive, Asynchronous Public Web-Based Forum for Facilitating Reflective Discourse with Preservice Science Teachers*. Doctoral Thesis. North Carolina State University, USA.

Brent, R., Brawner, C. E., & Van Dyk, P. (2002). Factors influencing student teachers' use of technology. *Journal of Computing in Teacher Education*, *19*(2), 61-68.

Brinkerhoff, J. (2006). Effects of a long-duration, professional development academy on technology skills, computer self-efficacy, and technology integration beliefs and practices. *Journal of Research on Technology in Education*, *39*(1), 22-43.

Brush, T., Glazewski, K., Rutowski, K., Berg, K., Stromfors, C., Van-Nest, M.

H., & Sutton, J. (2003). Integrating technology in a field-based teacher training program: The PT3@ ASU project. *Educational Technology Research and Development*, *51*(1), 57-72.

Bull, P. H. (2010). I Am A 21st Century Teacher: If You Teach Me with Technology I Will Use Technology to Teach My Students. In C.D. Maddux, D. Gibson, & B. Dodge (Eds.), *Research Highlights in Technology and Teacher Education 2010* (pp. 151-158).

Cahill, D., & Catanzaro, D. (1997). Teaching first-year Spanish on-line. *CALICO Journal, 14*(2-4), 97-114.

Canbolat, N. (2011). *Matematik öğretmen adaylarının teknolojik pedagojik alan bilgileri ile düşünme stilleri arasındaki ilişkinin incelenmesi* [A research on the interaction between technological pedagogical content knowledge and thinking styles of mathematics teacher candidates]. Master's Thesis. Selçuk University, Konya, Turkey.

Ceylan, B., Türk, M., Yaman, F., & Kabakçı-Yurdakul, I. (2014). Determining the Changes of Information and Communication Technology Guidance Teacher Candidates' Technological Pedagogical Content Knowledge Competency, Information and Communication Technology Usage Stages and Levels. *Journal of Theory and Practice in Education,10*(1), 171-201.

Chai, C. S., Koh, J. H. L., & Tsai, C.-C. (2010). Facilitating Preservice Teachers' Development of Technological, Pedagogical, and Content Knowledge (TPACK). *Educational Technology & Society, 13* (4), 63–73.

Chacon, T. C. (2005). Teacher' perceived efficacy among EFL teachers in middle schools in Venezuela. *Teaching and Teacher Education, 21*(3), 257-272.

Cox, S., & Graham, C. R. (2009). Using an elaborated model of the TPACK framework to analyze and depict teacher knowledge. *TechTrends*, *53*(5), 60-71.

Darling-Hammond, L. (1998). Teacher learning that supports student learning. *Educational Leadership, 55*(5), 6-11.

Donaldson, R., & Kotter, M. (1999). Language learning in cyberspace:

Teleporting the classroom into the target culture. *CALICO Journal, 16*(4), 530-557.

Dye, J. F., Schatz, I. M., Rosenberg, B. A., & Coleman, S. T. (2000). Constant comparison method: A kaleidoscope of data. *The Qualitative Report*, *4*(1/2).

Erdogan, A., & Sahin, I. (2010). Relationship between math teacher candidates' Technological Pedagogical and Content Knowledge (TPACK) and achievement levels. *Procedia-Social and Behavioral Sciences*, *2*(2), 2707-2711.

Ertmer, P. A. (2005). Teacher pedagogical beliefs: The final frontier in our quest for technology integration?. *Educational technology research and development*, *53*(4), 25-39.

Fortman, C. K. & Pontius, R. (2000). Self- efficacy during student teaching. Paper presented at the Annual Meeting of the Mid-Western Educational Research Association (Chicago, IL, October 25-28, 2000). Retrieved 18 April, 2014 from ERIC Document Reproduction Service.

Gencer, A. S., & Cakiroglu, J. (2007). Turkish preservice science teachers' efficacy beliefs regarding science teaching and their beliefs about classroom management. *Teaching and Teacher Education*, *23*(5), 664-675.

Ghaith, G., & Yaghi, H. (1997). Relationships among experience, teacher efficacy, and attitudes toward the implementation of instructional innovation. *Teaching and Teacher Education*, *13*(4), 451-458.

Gibbs, C. (2003). Effective teaching: exercising self-efficacy and thought control or action. *The Journal of Educational Enquiry*. *4*(2). 1-14.

Goetz, J. P., & LeCompte, M. D. (1981). Ethnographic Research and the Problem of Data Reduction. *Anthropology & Education Quarterly*, 51-70.

Göker, S. D. (2006). Impact of peer coaching on self-efficacy and instructional skills in TEFL teacher education. *System*, *34*(2), 239-254.

Gray, L., Thomas, N., & Lewis, L. (2010). *Teachers' Use of Educational*

Technology in US Public Schools: 2009 (NCES 2010-040). National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education. Washington, DC.

Guskey, T. R. (1981). Measurement of responsibility teachers assume for academic successes and failures in the classroom. *Journal of Teacher Education*, *32*, 44–51.

Guskey, T. R. (1988). Teacher efficacy, self-concept, and attitudes toward the implementation of instructional innovation. *Teaching and Teacher Education*, *4*(1), 63-69.

Guskey, T. R., & Passaro, P. D. (1994). Teacher efficacy: A study of construct dimensions. *American Educational Research Journal*, *31*(3), 627-643.

Guzey, S. S., & Roehrig, G. H. (2009). Teaching Science with Technology: Case Studies of Science Teachers' Development of Technological Pedagogical Content Knowledge (TPCK). *Contemporary Issues in Technology and Teacher Education*, *9*(1), 25-45.

Harris, T. L., & Hodges, R. E. (1995). *The literary dictionary: The vocabulary of Reading and writing.* Retrieved from books.google.com/books?isbn=0872071383.

Hoy, A. W. (2000, April). Changes in teacher efficacy during the early years of teaching. In *annual meeting of the American Educational Research Association*, New Orleans, LA.

Hoy, A. W., & Spero, R. B. (2005). Changes in teacher efficacy during the early years of teaching: A comparison of four measures. *Teaching and Teacher Education*, *21*(4), 343-356.

Huck, S. W. (2008). *Reading statistics and research* (5th ed.). New York: Addison Wesley Longman.

Hughes, J. (2004). Technology learning principles for preservice and in-service teacher education. *Contemporary Issues in Technology and Teacher Education*, *4*(3), 345-362.

Hughes, J. (2005). The role of teacher knowledge and learning experiences in forming technology-integrated pedagogy. *Journal of Technology and Teacher Education*, *13*(2), 277-302.

International Society for Technology in Education – ISTE. (2000). *ISTE National Educational Technology Standards (NETS) and Performance Indicators for Teachers*. Retrieved 11 May, 2014 from http://www.iste.org/docs/pdfs/nets_for_teachers_2000.pdf?sfvrsn=2, accessed 30 March, 2014.

Jang, S.-J., & Chen, K.-C. (2010). From PCK to TPACK: Developing a transformative model for pre-service science teachers. *Journal of Science Education and Technology, 19*(6), 553-564.

Kabakçı-Yurdakul, I. (2011). Examining technopedagogical knowledge competencies of preservice teachers based on ICT usage. *Hacettepe University Journal of Education, 40*, 397-408.

Kabakçı-Yurdakul, I. Odabaşı, F. Kılıçer, K. Çoklar, A.N., Birinci, G., and Kurt, A.A. (2012). The development, validity and reliability of TPACK-deep: A technological pedagogical content knowledge scale. *Computers and Education, 58*(3), 964-977.

Kabakçı-Yurdakul, I., & Çoklar, A. N. (2014). Modeling preservice teachers' TPACK competencies based on ICT usage. *Journal of Computer Assisted Learning.* Advance online publication. doi: 10.1111/jcal.12049.

Karakaya, Ç. (2013). *Fatih Projesi kapsamında pilot okul olarak belirlenen ortaöğretim kurumlarında çalışan kimya öğretmenlerinin teknolojik pedagojik alan bilgisi yeterlilikleri* [Technological pedagogical content knowledge (TPCK) of chemistry teachers who work in pilot high schools in Fatih Project]. Master's Thesis. Gazi University, Ankara, Turkey.

Kaya, Z. (2010). *Fen ve teknoloji öğretmen adaylarının fotosentez ve hücresel solunum konusundaki teknolojik pedagojik alan bilgisinin (TPAB) araştırılması* [Exploring the pre-service science and technology teachers' technological pedagogical content knowledge (TPCK) involving the topic of photosynthesis and cellular respiration]. Master's Thesis. Fırat University, Elazığ, Turkey.

Keiper, T., Harwood, A., & Larson, B. E. (2000). Preservice teachers' perceptions of infusing computer technology into social studies instruction. *Theory & Research in Social Education, 28*(4), 566-579.

Koç, M. (2005). Implications of learning theories for effective technology integration and pre-service teacher training: A critical literature review. *Journal of Turkish Science Education*, *2*(1), 2-18.

Koçoğlu, Z. (2011). Emotional intelligence and teacher efficacy: a study of Turkish EFL pre-service teachers. *Teacher Development*, *15*(4), 471-484.

Koehler, M. J., Mishra, P., Hershey, K., & Peruski, L. (2004). With a little help from your students: A new model for faculty development and online course design. *Journal of Technology and Teacher Education*, *12*(1), 25-55.

Koehler, M., Mishra, P., Yahya, K. & Yadav, A. (2004). Successful Teaching with Technology: The Complex Interplay of Content, Pedagogy, and Technology. In R. Ferdig et al. (Eds.), *Proceedings of Society for Information Technology & Teacher Education International Conference 2004* (pp. 2347-2354). Chesapeake, VA: AACE.

Koehler, M. J., & Mishra, P. (2005). What happens when teachers design educational technology? The development of technological pedagogical content knowledge. *Journal of Educational Computing Research*, *32*(2), 131-152.

Koehler, M. J., & Mishra, P. (2008). Introducing technological pedagogical knowledge. In AACTE (Eds.), *The handbook of technological pedagogical content knowledge for educators*. Routledge / Taylor & Francis Group for the American Association of Colleges of Teacher Education.

Koehler, M. J., & Mishra, P. (2009). What is technological pedagogical content knowledge? *Contemporary Issues in Technology and Teacher Education*, *9*(1), 60-70.

Koehler, M. J., Mishra, P., & Cain, W. (2013). What is Technological Pedagogical Content Knowledge (TPACK)? *Journal of Education 193* (3), 13-19.

Kurt, G. (2012). *Developing technological pedagogical content knowledge of Turkish pre-service teachers of English through a design study*. Doctoral Thesis. Yeditepe University, İstanbul, Turkey.

Lambert, J., & Sanchez, T. (2007). Integration of cultural diversity and technology: Learning by design. *Meridian Middle School Computer Technologies Journal, 10*(1). Retrieved May 2, 2014, from http://www.ncsu.edu/meridian/win2007/pinballs/index.htm.

Landry, G. A. (2010). *Creating and validating an instrument to measure middle school mathematics teachers' technological pedagogical content knowledge (TPACK).* Doctoral Thesis. University of Tennessee, Tennessee, USA.

Lee, V. E., Dedrick, R. F., & Smith, J. B. (1991). The effect of the social organization of schools on teachers' efficacy and satisfaction. *Sociology of Education*, *64* (3), 190-208.

Leh, A. S. C. (2005). Lessons learned from service learning and reverse mentoring in faculty development: A case study in technology training. *Journal of Technology and Teacher Education, 13* (1), 25-41.

Liaw, E. (2004). *How are they different? A comparative study of native and nonnative foreign language teaching assistants regarding selected characteristics: Teacher efficacy, approach to language teaching /learning, teaching strategies and perception of nativeship*. Doctoral Thesis. The Ohio State University, Ohio, USA.

Littrell, A. B., Zagumny, M. J., & Zagumny, L. L. (2005). Contextual and Psychological Predictors of Instructional Technology Use in Rural Classrooms. *Educational Research Quarterly, 29*(2), 37-47.

Lohman, M. C. (2000). Environmental inhibitors to informal learning in the workplace: A case study of public school teachers. *Adult Education Quarterly, 50*(2), 83-101.

Makinen, M. (2006). Digital Empowerment as a Process for Enhancing Citizens' Participation. *E-Learning, 3*(3), 381-395.

Martin, D., & Loomis, K. (2013). *Building teachers: A constructivist approach to introducing education*. Cengage Learning.

Mede, E. (2009). An analysis of relations among personal variables, perceived self-efficacy and social support on burnout among Turkish EFL teachers. *Inonu University Journal of the Faculty of Education*, *10*(2), 39-52.

Mishne, J. (2012). *An investigation of the relationships between technology use and teachers' self-efficacy, knowledge and experience.* Doctoral Thesis. Pepperdine University, California, USA.

Mishra, P., Spiro, R. J., & Feltovich, P. J. (1996). Technology, representation, and cognition: The prefiguring of knowledge in cognitive flexibility hypertexts. *Advances in discourse processes, 58*, 287-305.

Mishra, P. (1998). *Flexible learning in the periodic system with multiple representations: The design of a hypertext for learning complex concepts in chemistry*. Doctoral Thesis. University of Illinois, USA.

Mishra, P., & Koehler, M. J. (2006). Technological Pedagogical Content Knowledge: A new framework for teacher knowledge. *Teachers College Record*, *108*(6), 1017-1054. doi:10.1111/j.1467-9620.2006.00684.x.

Mishra, P., & Koehler, M. (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. *The Teachers College Record*, *108*(6), 1017-1054.

Mishra, P., & Koehler, M. (2008a). *Introducing technological pedagogical content knowledge*. Paper presented at the Annual Meeting of the American Educational Research Association, New York City, NY.

Mishra, P., & Koehler, M. (2008b). *Technology integration in teaching: The TPACK framework.* Retrieved March 18, 2014, from http://iste.acrobat.com/p92764644/.

Mishra, P., & Koehler, M. J. (2009). TPCK - Technological Pedagogical Content Knowledge. Retrieved April 11, 2014, from http://tpck.org.

Mullock, B. (2006). The pedagogical knowledge base of four TESOL teachers. *The Modern Language Journal, 90*, 48-66.

Mutluoğlu, A. (2012). *İlköğretim matematik öğretmenlerinin öğretim stili tercihlerine gore teknolojik pedagojik alan bilgilerinin incelenmesi* [Examining primary mathematics teachers’ technological pedagogical content knowledge according to their preffered teaching styles]. Master's Thesis. Necmettin Erbakan University, Konya, Turkey.

Niess, M. L. (2005). Preparing teachers to teach science and mathematics with technology: Developing a technology pedagogical content knowledge. *Teaching and Teacher Education*, *21*, 509-523.

Niess, M. L. (2008). Guiding preservice teachers developing TPCK. In J. Colbert, K. Boyd, K. Clarke, S. Guan, J. Harris, M. Kelly, & A. Thompson (Eds.), *Handbook of Technological Pedagogical Content Knowledge (TPACK) for Educators,* pp. 223-250. New York, NY: Routledge.

Okojie, M. C., Olinzock, A. A. & Okojie-Boulder, T.C. (2006). The pedagogy of technology integration. *The Journal of Technology Studies, 32*(2), 66-71.

Ortaçtepe, D. (2006). *The relationship between teacher efficacy and professional development within the scope of an in-service teacher education program.* Master's Thesis. Boğaziçi University, İstanbul, Turkey.

Pajares, M. F. (1992). Teachers' beliefs and educational research: Cleaning up a messy construct. *Review of Educational Research, 62*(3), 307-332.

Pajares, F. (1996). Self-efficacy beliefs in academic settings. *Review of Educational Research*, *66*(4), 543–578.

Pajares, F. (1997). Current directions in self-efficacy research. *Advances in motivation and achievement*, *10*(149), 1-49.

Park, S. H., & Ertmer, P. A. (2007). Impact of problem-based learning (PBL) on teachers' beliefs regarding technology use. *Journal of Research on Technology in Education, 40*(2), 247–267.

Peacock M (2001) Pre-service ESL teachers' beliefs about second language learning: a longitudinal study. *System 29* (2), 177-95.

Pekkanli-Egel, İ. (2009). The prospective English language teacher's reflections of self efficacy. *Procedia-Social and Behavioral Sciences*, *1*(1), 1561-1567.

Pelgrum, W. J. (2001). Obstacles to the integration of ICT in education: Results from a worldwide educational assessment. *Computers and Education*, *37*, 163–178.

Pendergast, D., Garvis, S., & Keogh, J. (2011). Pre-service student-teacher self-efficacy beliefs: An insight into the making of teachers. *Australian Journal of Teacher Education*, *36*(12), 4.

Petrou, D. (2012). Digital Empoverment, *A Project Founded by European Commission (505052-2009-LLP-GR-KA3MP)*. Retrieved 23 January, 2014, from http://eacea.ec.europa.eu/llp/projects/public_parts/documents/ict/2011/ict_mp_505052_digem_pub.pdf.

Pierson, M.E. (1999). *Technology integration practice as a function of pedagogical expertise.* Doctoral Thesis. Arizona State University, USA.

Pierson, M. E. (2001). Technology integration practice as a function of pedagogical expertise. *Journal of Research on Computing in Education*, *33*(4), 413-430.

Putnam, R. T., & Borko, H. (2000). What do new views of knowledge and thinking have to say about research on teacher learning? *Educational Researcher, 29*(1), 4-15.

Reinders, H. (2009). Technology and Second Language Teacher Education. In A. Burns; J. C. Richards (Eds.). *Second language teacher education*. Cambridge: Cambridge University Press, 2009 (pp. 230-237).

Rideout, V., Foehr, U., & Roberts, D. (2010). *Generation M: Media in the lives of 8–18 year-olds: A kaiser family foundation study, January, 2010.* Menlo Park, CA. Retrieved March 3, 2014, from http://www.kff.org/entmedia/upload/8010.pdf

Ringstaff, C., & Kelley, L. (2002). *The learning return on our educational technology investment: A review of findings from research.* San Francisco, CA: West Ed RTEC.

Rittel. H., & Webber, M., (1973). Dilemmas in a general theory of planning. *Policy Sciences, 4*(2), 155-169.

Rose, J. & Medway, F. J. (1981). Measurement of teachers' beliefs in their control over student outcome. *Journal of Educational Research, 74,* 185-190.

Russell, M., Bebell, D., O'Dwyer, L., & O'Connor, K. (2003). Examining teacher technology use: Implications for preservice and inservice teacher preparation. *Journal of Teacher Education*, *54*(4), 297–310.

Sahin, I., Akturk, A., & Schmidt, D. (2009). Relationship of preservice teachers' technological pedagogical content knowledge with their vocational self-efficacy beliefs. In C. D. Maddux (Ed.), *Research Highlights in Technology and Teacher Education 2009*, (pp. 293–301). Chesapeake, VA: AACE.

Sahin, I. (2011). Development of survey of technological pedagogical and content knowledge (TPACK). TOJET-The Turkish Online Journal of Educational Technology, 10(1), 97–105.

Sarıçoban, A. (2013). Prospective and Regular ELT Teachers' Digital Empowerment and Their Teacher Self-Efficacy Beliefs, *Porta Linguarum 20*, 77-87.

Sarıkaya, H. (2004). *Preservice Elementary Teachers' Science Knowledge, Attitude toward Science Teaching and Their Efficacy Beliefs Regarding Science Teaching.* Doctoral Thesis. Middle East Technical University, Ankara, Turkey.

Savaş, M. (2011). *Investigating pre-service science teachers' perceived technological pedagogical content knowledge regarding genetics.* Master's Thesis. Middle East Technical University, Ankara, Turkey.

Savran, A., & Çakıroğlu, J. (2001). Preservice biology teachers' perceived efficacy beliefs in teaching biology. *Hacettepe University Journal of Education Faculty*, *21*, 105-112.

Savran, A., & Çakıroğlu, J. (2003). Differences between elementary and secondary preservice science teachers' perceived efficacy beliefs and their classroom management beliefs. *The Turkish Online Journal of Educational Technology*, *2*(4), 15-20.

Schmidt, D. A., Baran, E., Thompson, A. D., Koehler, M. J., Mishra, P., & Shin,

T. (2009). Technological pedagogical content knowledge (TPACK): the development and validation of an assessment instrument for preservice teachers. *Journal of Research on Technology in Education*, *42*(2), 123–149.

Semiz, K. (2011). *Pre-service physical education teachers' technological pedagogical content knowledge, technology integration self-efficacy and instructional technology outcome expectations.* Master's Thesis. Middle East Technical University, Ankara, Turkey.

Shim, J. (2001). *The teacher efficacy beliefs of Korean teachers of English as a foreign language.* Doctoral Thesis. The Ohio State University, Ohio, USA.

Shulman, L. S. (1986). Those who understand: Knowledge growth in teaching. *Educational Researcher*, *15*(2), 4-14.

Shulman, L. S. (1987). Knowledge and teaching: Foundations of the new reform. *Harvard Educational Review, 57*(1), 1–22.

Shoffner, M. (2010). Technological Pedagogical Collaboration: Preservice English Teachers and Collaborative Projects. In C.D. Maddux, D. Gibson & B. Dodge (Eds.), *Research Highlights in Technology and Teacher Education 2010* (pp. 187-194).

Sianjina, R. R. (2000). Educational technology and the diverse classroom. *Phi Delta Kappan, 37*, 26-29.

Snider, S. (2003). Exploring technology integration in a field-based teacher education program: Implementation efforts and findings. *Journal of Research on Technology in Education*, *34*(3), 230-249.

Spanos, T., Hansen, C. M., & Daines, E. (2001). Integrating technology and classroom assessment. *Foreign Language Annals*, *34*(4), 318-324.

Stemler, S. (2001). An overview of content analysis. *Practical Assessment, Research & Evaluation*, *7*(17), 137-146.

Stobaugh, R.R., McDonald, M. & Tassell, J.L. (2010). Student Teacher Use of Technology to Facilitate Teaching and Learning. In C.D. Maddux, D. Gibson & B. Dodge (Eds.), *Research Highlights in Technology and Teacher Education 2010* (pp. 43-52).

Temiz, T., & Topcu, M. S. (2013). Preservice teachers' teacher efficacy beliefs and constructivist-based teaching practice. *European journal of psychology of education*, *28*(4), 1435-1452.

Timur, B. (2011). *Fen bilgisi öğretmen adaylarının kuvvet ve hareket konusundaki teknolojik pedagojik alan bilgilerinin gelişimi* [The development of pre-service science teachers' technological pedagogical content knowledge in force and movement subjects]. Doctoral Thesis. Gazi University, Ankara, Turkey.

Thompson, A.D., & Mishra, P. (2007). Breaking news: TPCK becomes TPACK! *Journal of Computing in Teacher Education, 24*(2), 38-64.

Tinio, V. L. (2003). *ICT in education*. Retrieved from http://2002.bilisimsurasi.org.tr/egitim/eprimer-edu.pdf.

Tournaki, N., & Podell, D. M. (2005). The impact of student characteristics and teacher efficacy on teachers' predictions of student success. *Teaching and Teacher Education*, *21*(3), 299-314.

Tschannen-Moran, M., Woolfolk Hoy, A. & Hoy, W. K. (1998). Teacher efficacy:Its meaning and measurement. *Review of Educational Research, 68*(2), 202-248.

Tschannen-Moran, M. & Woolfolk Hoy, A. (2001). Teacher efficacy: capturing an elusive construct. *Teaching and Teacher Education, 17, 783-805.*

Tunç-Yüksel, B. (2010). *Teacher efficacy beliefs of Turkish EFL teachers: A study with Turkish EFL teachers working at state primary schools.* Master's Thesis. Anadolu University, Eskişehir, Turkey.

Türk Eğitim Derneği (2009). *Öğretmen yeterlikleri [Teacher competencies]*. Retrieved 22 February, 2014, from http://portal.ted.org.tr/yayinlar/Ogretmen_Yeterlik_Kitap.pdf.

Tweed, S. (2013). *Technology Implemetation: Teacher Age, Experience, Self-Efficacy, and Professional Development as Related to Classroom Technology Integration.* Doctoral Thesis. East Tennessee State University, Tennessee, USA.

Uğurlu, R. (2009). *Teknolojik pedagojik alan bilgisi çerçevesinde önerilen* *eğitim programı sürecinde öğretmen adaylarının şekillendirici ölçme ve değerlendirme bilgi ve becerilerinin gelişiminin incelenmesi* [Investigating the development of prospective mathematics teacher's knowledge and skills of formative assessment through a program proposed using technological pedagogical content knowledge framework]. Master's Thesis. Marmara University, İstanbul, Turkey.

Uygun, E. (2013). *Learning by design: an integrated approach for technological pedagogical content knowledge development*. Master's Thesis. Middle East Technical University, Ankara, Turkey.

Van Olphen, M. (2008). TPCK: An integrated framework for educating world language teachers. In AACTE Committee on Innovation and Technology (Ed.), *The Handbook of Technological Pedagogical Content Knowledge (TPCK) for Educators*. New York: American Association of Colleges of Teacher Education and Routledge.

Wan, C. P. (2005). Teaching efficacy beliefs of pre-service teachers. *Jurnal IPBA/Jilid3: Bilangan, 2*.

Woolfolk Hoy, A. (2000). *Changes in Teacher Efficacy during the Early Years of Teaching.* Paper presented at the annual meeting of the American Educational Research Association, New Orleans, LA.

Woolfolk Hoy, A. E., & Burke-Spero, R. (2005). Changes in teacher efficacy during the early years of teaching. *Teaching and Teacher Education, 21* (4), 343-356.

Woolfolk, A. (2007). Educational Psychology (10th Ed.). Boston, MA: Allyn & Bacon.

Yalçın, A. F. (2011). Investigation of science teacher candidates' self-efficacy beliefs of science teaching with respect to some variables. *International Online Journal of Educational Sciences*, *3*(3), 1046-1063.

Yılmaz, C. (2011). Teachers' perceptions of self-efficacy, English proficiency, and instructional strategies. *Social Behavior and Personality: An International Journal*, *39*(1), 91-100.

Yüksel, G., & Alcı, B. (2012). Self-Efficacy and Critical Thinking Dispositions as Predictors of Success in School Practicum. *International Online Journal of Educational Sciences*, *4*(1), 81-90.

Zhao, Y. (2003). *What teachers should know about technology: Framing the question*. Retrieved from books.google.com.tr/books?isbn=1593110367.