TPACK EXPERIENCE IN CALL THROUGH AN LBD APRROACH: A CASE STUDY REFLECTING ELT TEACHERS' CALL PERCEPTIONS AND PRACTICES IN AN ONLINE ICT COURSE

Pınar ALP

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Approval of the GraduateSchool of Educational Sciences

_____

Assist. Prof. Sinem VATANARTIRAN

Director

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

_____

Assist. Prof. Aylin TEKİNER TOLU

Coordinator

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

_____

Assist. Prof. Aylin Tekiner Tolu

Supervisor

Examining Committee Members

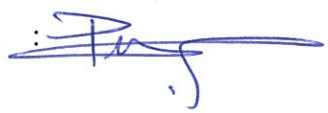
Assist. Prof. Aylin TEKİNER TOLU (BAU,ELT) _____

Assoc. Prof. Feyza DOYRAN (BAU,EDS) _____

Assist. Prof. Kenan DİKİLİTAŞ (HKU,ELT) _____

I hereby declare that all information in this document has been obtained and presented in accordance with academic rules and ethical conduct. I also declare that, as required by these rules and conduct, I have fully cited and referenced all material and results that are not original to this work.

Name, Last Name: Pınar ALP

Signature : 

ABSTRACT

TPACK EXPERIENCE IN CALL THROUGH AN LBD APRROACH: A CASE STUDY REFLECTING ELT TEACHERS' CALL PERCEPTIONS AND PRACTICES IN AN ONLINE ICT COURSE

Alp, Pınar

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

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This study aims at exploring technological pedagogical content knowledge (TPACK) development of 13 in-service ELT teachers' teaching perceptions and practices in Computer Assisted Language Learning (CALL) within the context of an online Information and Communication Technology (ICT) in Education Master's Course offered at a private university in Turkey in Fall 2014. Following the qualitative case study methodology, this research was implemented in a Learning-by-Design (LBD) environment, aiming to explore the ELT teachers' Attitudes towards Computers (TAC), how the course mediated the ELT teachers' TPACK development, and how the ELT teachers reflected on their technology integration experiences in this online course. To support the data sources including qualitative data through interview questions, document analysis of LBD artifacts, and online course discussions; quantitative data through TPACK and TAC surveys were employed in the present study. Findings of the study showed that, though not quantitatively significant – a fact which might be attributed to the need

for a more in-depth and content-specific guidance in measuring TAC and TPACK constructs –, qualitatively, the CALL experience through a TPACK framework situated in an LBD setting within an online ICT course, served as an effective breeding-ground for ELT teachers' improvement of teaching perceptions and practices through active engagement, with authentic learning experiences in a collaborative environment.

Keywords: TPACK, CALL, ELT Teacher Education, Learning by Design

ÖZ

BİLGİSAYAR DESTEKLİ DİL ÖĞRETİMİNDE TASARIM YOLUYLA ÖĞRENME YAKLAŞIMIYLATEKNOLOJİK PEDAGOJİK ALAN BİLGİSİ DENEYİMİ:BİLGİ VE İLETİŞİM TEKNOLOJİLERİ DERSİALAN İNGİLİZCE ÖĞRETMENLERİNİN BİLGİSAYAR DESTEKLİ YABANCI DİL ÖĞRETİMİ ALGI VE UYGULAMALARINI YANSITAN BİR DURUM ÇALIŞMASI

Alp, Pınar
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Bu çalışmanın amacı, 2014 güz döneminde Türkiye'de bir özel üniversitede verilen "Eğitimde Bilgi ve İletişim Teknolojileri" (EBİT) çevrimiçi yüksek lisans dersine katılan 13 İngilizce öğretmeninin öğretim algı ve uygulamalarındaki teknolojik pedagojik alan bilgisi (TPAB) gelişimlerini araştırmaktır. Bu durum çalışmasında, öğrencilerin TPAB gelişimleri, tasarım yoluyla öğrenme (LBD) modülü ile izlenmiş, bu çerçevede; öğretmenlerin çevrimiçi EBİT dersi öncesi ve sonrasındaki bilgisayar ve teknoloji tutumları, dersin öğretmenlerin TPAB gelişininini nasıl etkilediği ve öğretmenlerin bu çevrimiçi dersteki teknoloji entegrasyon deneyimlerini nasıl yansıttıklarnın anlaşılması hedeflenmiştir. Çalışmanın deseni nitel durum çalışması metodolojisiylekurulmuş olup veri kaynakları:mülakat soruları, tasarım yoluyla öğrenme materyalleri ve online ders tartışma panosunun doküman analizi için kullanılan nitel verilerinyanı sırabilgisayar tutum anketi ile TPAB anketinden elde edilen nicel verilerin oluşmaktadır. Araştırma sonuçlarına göre; - TPAB ve bilgisayar tutumlarına dair kavramların daha detaylı ve içeriğe uygun ölçümlere ihtiyacı paralelinde nitel olarak anlamlı olmasa da – çevrimiçi bir EBİT dersi kapsamında TPABkuramsalçerçevesinde edinilen bilgisayar destekli yabancı dil öğretimi

deneyiminin, İngilizce öğretmenlerinin öğretim algı ve uygulamalarının gelişmesinde olumlu etkisi gözlenmiştir. Söz konusu gelişim, tasarım yoluyla öğrenme ortamında öğretmenlerin süreçle aktif olarak bütünleştikleri özgün öğrenme materyalleri hazırlama ve bunun için işbirliği oluşturmaya dayalı teknoloji entegrasyon deneyimlerinde gözlemlenmiştir.

Anahtar kelimeler:Teknolojik Pedagojik Alan Bilgisi, Bilgisayar Destekli Dil Öğretimi, İngilizce Öğretmeni Eğitimi, Tasarım Yoluyla Öğrenme

To my wise son,Ata.

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LIST OF ABBREVIATIONS

TPACK	Technological Pedagogical Content Knowledge
ELT	English Language Teaching
CALL	Computer Assisted Language Learning
LBD	Learning by Design
TAC	Teachers' Attitudes Towards Computers
ICT	Information and Communication Technologies

Chapter 1: Introduction

This chapter provides an introduction to the present study. It begins with a theoretical framework of the study, followed, in turn, by the statement of the problem, purpose of the study, the related research questions, significance of the study, and finally the operational definitions for the basic and frequently used terms in the study.

1.1 Theoretical Framework

The improvements in information technology triggered a continuous shift and transformative changes in learning programs, leading to an extensive impact on educational research and practice among scholars (Agyei & Vogt, 2012; Mishra & Koehler, 2006), inevitably igniting endeavors for educational reforms (Pineida,2011). Through these reforms, it is believed that not only teachers' proficiency will advance with the use of Information and Communication Technology (ICT), but also better student learning outcomes via authentic student learning in the 21stcentury will be maintained (Jimoyiannis, 2010). Specifically, how to integrate ICT effectively into the teaching process has become of crucial significance as solely introducing technology in education is inadequate for a sound teaching with technology (Mishra & Koehler, 2006). In the case of the use of ICT in English Language Teaching (ELT), particularly in CALL teacher education sphere, teachers retain the central role in the language learning classrooms since they are to decide whether technology or CALL maintains significance in their teaching, and accordingly, they are to make a choice on the technology to reinforce their teaching, which then actuates the type of CALL practices the learners are exposed to and how learners apply them (Hubbard, 2008). On a diverse scale from "small groups of enthusiastic language teacher-programmers to a growingcluster of national and international professional organizations" (Hubbard, 2008, p. 175), due to its effect in enhancing students' learning in a wide range of ways, CALL has been receiving significant attention in both learning and teaching EFL. A variety of studies demonstrate that, upon integration of technology into language teaching and learning, considerable increase was observed in students' academic performance,

motivation and learning perspectives (Almekhlafi, 2006; Kozma, 2003; Kulik, 1994); in their active participation and involvement in writing tasks (Al-Jarf, 2004); their writing skills (Chikamatsu, 2003), in their engagement in cross-cultural perceptions and reflections (Kamhi-Stein, 2000; Robin & Harris, 1998); and the creative idea generation skills (Harris,1998). Moreover, technology experience in EFL spheres has also become an essential skill for instructors. To illustrate, it was observed that among open positions posted on the TESOL Career Center(http://careers.tesol.org), 39 percent of them required CALL or technology skills (Hubbard, 2008) and an increase by 60 percent in the amount of these posts was observed within the following five months, requiring candidates for such positions who are trained with or experienced in ‘‘CALL, online delivery, or educational technology as a required or desirable attribute’’(Kessler, 2006, p. 23).

Various language teacher education programs including MA TEFL programs and technology focused workshops play a crucial roleinfulfilling this need for supplying such technologically competent teachers with required CALL competencies. Literature supports the significant impact of such programs in teachers’ acquisition of positive attitudes towards CALL via the application of technology with tools such as a computer mediated communication (CMC) tool (Web-based message board), ICT and an online course management system. (Altun, 2005; Kamhi-Stein, 2000; Kassen& Higgins, 1997; Redmond, Albion&Maroulis, 2005; vanOlphen, 2007).Moreover, research points out another impact of technology courses on teachers in terms of improving their confidence in integrating technology into their instruction (Hegelheimer, 2006; Hoven, 2007;Peters, 2006; Wetzel & Chisholm, 1998), a factor which, according to Hong (2010), is the building stone in extending their knowledge of tackling pedagogical application of CALL technology.

Nevertheless, teacher education programs have undergone criticism due to various reasons, one of which is their insufficiency in preparing teachers for an effective technology use in instruction (Milken Family Foundation, 2007; NCES, 2000; NEA, 2008). Specifically, in the context of CALL teacher education programs, the ‘what’ and ‘how’ aspect of these programs in terms of what they should encompass and how they impact teachers’ improvement and integration of CALL skills, are the two issues to be dealt with. This might be attributed to the incorporation of technology into teaching, being an intricate issue which urges a

more expansive understanding of elaborate interactions among a variety of factors (Koehler, Mishra & Yahya, 2007). Moreover, though providing computer skills can eliminate the first-order – extrinsic – barriers to integrating technology, it is still challenging to remove the second-order – intrinsic – barriers related to teachers' teaching beliefs, requiring a challenge in changing their routines after practice (Ertmer, 1999). Thus, teachers' ''pedagogical knowledge of effective instructional practices that incorporate meaningful uses of technology'' (Ertmer, 1999, p. 48) is as crucial as their technical skills. Accordingly, as pointed out by Mishra and Koehler (2005),technological knowledge is not to be a supplement, but a component of the overall teacher knowledge. In other words, content and pedagogical knowledge, accompanied by supporting intrinsic allowance of a teacher should go along with a meaningful incorporation of technology in the classroom.

Another cause for criticism on teacher education programs is the absence of theoretical groundwork. In this respect, it can be stated that though theory is crucial, it has been overlooked in the field of educational technology (Issroff& Scanlon, 2002). Considering this lack of theoretical base among researchers and practitioners for technology integration into teaching, literature reveals a significant need for theoretical and conceptual frameworks (Issroff& Scanlon, 2002; Mishra &Koehler,2006; Schrum,1999; Zhao,2003).Hence, these challenges necessitated the urge for TPACK framework in responding to the lack of theoretical basis, conceptualizing and theorizing the knowledge base practiced in integrative CALL cycle – a foundation which would also facilitate the understanding of fundamental factors that could promote and impede technology integration into pedagogy and content.

Constructed on Shulman's (1986,1987) concept of pedagogical content knowledge, insertion of technology competency to serve as a primary knowledge component was proposed by Mishra and Koehler (2006) to equip the teachers of 21st century classrooms, resulting in the coinedterm, technological pedagogical and content knowledge, which was abbreviated to TPCK and afterwards to TPACK (Thompson & Mishra, 2007). Promoting the unification of the three integral teacher knowledge domains, content knowledge (CK), pedagogical knowledge (PK), and technology knowledge, the TPACK framework highlights the complex interplay among these areas of expertise. More explicitly, TPACK framework does not alone

facilitate the search for the interaction within these three domains, but new kinds of knowledge out of their convergence including pedagogical content knowledge (PCK), technological content knowledge (TCK), technological pedagogical knowledge (TPK) and TPACK. Essentially, this peculiarity of TPACK framework led to its prominenceand application as a theoretical framework in academic studies and practices (e.g. Brush &Saye, 2009; Bull & Bell, 2009; Rahmany, Sadeghi&Chegini, 2014, Guzey&Roehrig, 2009; Koh&Divaharan, 2011; Rienties, Brouwer&Lygo-Baker, 2013).Nevertheless, due to its nature as a complex, multi-faceted, situated theory (Mishra & Koehler, 2006; Harris,Grandgenett. & Hofer, 2010), understanding of TPACK is still limited, and its development requires investigation through integrated approaches. TPACK research as yet has primarily focused on activities involving a variety of technology integrated educational tools (e.g. Hofer &Grandgenett, 2012, Koehler et al. 2007; Rienties et al. 2013; Ta Chien, Yen Chang, KuangYeh& En Chang, 2012) with inadequate focus on questioning self-perceived TPACK and how it is reflected into instructional practices. Thus, the goal of this study is to examine the interaction between the learners' self-reported TPACK and the reflection of it in the design process of learning artifacts based on this framework.

Administration of a thorough TPACK analysis requires data triangulation withvarious measurement techniques including self- reported measures such as surveys; performance-based measures in the form of teaching artifacts or lesson plans, and interviewsas put by Koehler, Shin &.Mishra (2011). In this sense, there has occurred an urge for the execution of such a variety of measurement techniques within TPACK literature in understanding the development of such complex knowledge (e.g. Koehler et al., 2007; Graham, Borup& Smith, 2012; Rienties et al. 2013; Shin, Koehler, Mishra, Schmidt, Baran, & Thompson, 2009). Among these techniques, self-reported measures which are based on collecting data on teachers' technology integration self-perceptions have been the most commonly used ones in the research investigating TPACK development (i.e. Graham et al., 2012; Shin et al., 2009; Mishra& Koehler, 2005b). Additionally, interviews have also been executed to assist in assessing the quality of TPACK based technology integration (e.g.Koehler et al.,2004; Kurt, 2012). However, among the aforementioned techniques, the application of performance-based measures is significant as it ensures the

opportunity to examine teachers' TPACK development within the process of their instructional design activities including lesson plan artifacts, course assignments or online discussions. (e.g. Hofer & Grandgenett, 2012; Koehler et al., 2007; Pamuk, 2012). Essentially, incorporating various data via triangulation is crucial in reaching a more in-depth understanding of the TPACK, considering its complex, interdependent nature. The present study therefore, targeted acknowledging this requirement while integrating these particular techniques – self-reported measures, interviews and performance based measures –in the pursuit of a more thorough TPACK analysis.

Aiming to help teachers thrive in TPACK, Learning by Design (LBD) which is a project-based, learner-centered instructional theory,first introduced by Kolodner, Camp, Crismond, Fasse, Gray, Holbrook, Puntambekar, &Ryan, (2003)is used as a model to provide a theoretical lens for the present study. It should be noted that, also implemented by Koehler and Mishra (2005a, 2005b) on Master's level technology courses for in-service teachers and faculty members, LBD theory served as a guiding model according to which the teachers are to practice teaching with technology via designing technological artifacts in order to deal with instructional tasks. Since the learners are involved in the design of the artifact within a real-world setting where their understanding towards a topic or concept is constructed (Han & Bhattacharya, 2001), LBD environment was thus considered applicable in guiding teachers with their TPACK development. Entailing the examination of learning by design (LBD) activities,the current study pursued the goal of tracking teacher/students' involvement in the design of learning materials within the TPACK framework. The LBD approach emphasizes the participants' gathering in order to design a technology integrated material, so that the subtle interrelation among pedagogy, content and technology could be understood (Koehler & Mishra, 2005b). In addition, LBD environment allows for the examination of various data sources for a more grounded understanding of TPACK'S complex nature. Furthermore, literature reports the positive impact of LBD activities on TPACK development (Alayyar, Fisser&Voogt, 2010; Koehler et al., 2007; Koehler & Mishra 2005a, 2005b; Lu, Johnson,Tolley, Gillard-Cook, & Lei, 2011,). Essentially, ensuring the opportunity to realize data triangulation from a variety of sources via mingling practices and activities to

explore the interaction between them, the LBD approach provided a setting for this study suitable for a thorough investigation of the TPACK development.

1.2 Statement of the Problem

As depicted in the theoretical framework of this study, first introduced as a framework indicating interaction among teachers' technological, pedagogical and content knowledge to ensure effective teaching alongside technology, TPACK was rendered as a complex, multi-faceted and situated construct (Mishra & Koehler, 2006). From then on, research on a variety of educational contexts has been carried out for the purpose of teachers' mastering such a complex knowledge (e.g. Fransson & Holmberg, 2012; Guzey & Roehrig, 2009; Kafyulilo, Koehler, Mishra, & Yahya, 2007; Koh & Divaran, 2011; Rienties, Brouwer, & Baker, 2013) in an attempt to improve participants' TPACK proficiencies.Yet, such instructional processes are limited in exploring 'what practitioners do with TPACK and how they employ it in instruction'. To be more specific, Koehler et al. (2007) state that, ''Developing TPACK is a multigenerational process, involving the development of deeper understandings of the complex web of relationships between content, pedagogy and technology and the contexts in which they function''(p.758).Moreover, Harris et al. (2010) maintain that the literature involves a number of evaluation techniques used for measuring this complex knowledge for the purpose of exploring its development among teachers to be specifically grouped as: (1) self-reported measures including surveys, (2) performance-based measures such as teaching artifacts or course assignments, and (3) interviews.

Thus, it is clear that data triangulation involving these techniques is crucial in terms of ensuring a more in-depth understanding of complexity of interaction among content, pedagogy and technology in developing TPACK. The present study aims at exploring this understanding by incorporating such variety of data collection tools.

In the present study, the use of data triangulation paved the way for implementation of learning by design (LBD) approach, whichensured essential immersion of students into the design of TPACK-basedteaching materials. This is well supported by Koehler & Mishra (2005b), due to the fact that by LBD approach, to recognize the delicate relationship between and among pedagogy, content and technology, the participants gather and design materials incorporating technology. Thus, by

exercising LBD approach, the following study allows triangulation, with multiple sources of data ensured by the nature of this design type, which is described as having an explicit impact on TPACK in the literature (Alayyar, 2011; Koehler et al.,2007; Koehler &Mishra, 2005a, 2005b, Fransson and Holmberg, 2012; Koh and Divaharan, 2011; Pamuk,2012; Guzey and Roehrig, 2009; Kurt, 2012; Timur,2011; Canbazoğlu Bilici,2012).

1.3 Purpose of the Study

The current study aims at examining not only the interaction between the ELT teachers' teaching perceptions and practices while participating in an online ICT master's course, but also the impact of LBD factor on these participants' development of TPACK within their CALL experience. The study was conducted in an online Master's course setting, called, ICT in Education, offered for both the İzmir and İstanbul graduate students ofBahçeşehir University, a private university in Turkey inFall 2014. Participants of the study were graduate students enrolled in the İstanbul component of the course and graduates in the related online course's İzmir setting.In addition, the study attempts to address the present situation of research relating to teacher education in CALL and TPACK, with an attempt to focus on issues related with methodological constraints among related studies in the literature.Accordingly, this study suggests the multiplicity of methods for assessing teachers' technology integration such as the addition of performance-based measurements to accompany others including self-reported techniques and interviews, as in literature, it is found crucial in revealing the complex interdependent nature of the TPACK concept (Mueller, 2010; Niess&Gillow-Wiles, 2010). Situated in a qualitative case study design which is supported by quantitative data sources; both quantitative (surveys) and qualitative (online discussions, interviews, and course artifacts) data were collected, coded and analyzed to guide the study on the effect of LBD model in the TPACK development of the ELT in-service teachers from different aspects.

1.4 Research Questions

TPACK research addressed several gaps, especially with scarcity of related studies involving the impact of TPACK through a LBD approach, specifically in ELT context. Considering the fact that the teachers' pedagogical beliefs about

themselves and their instructional actions are not always aligned as put by Lawless and Pellegrino (2007), the current study sought to analyze how TPACK components interacted with teachers' teaching perceptions and practices, focusing on their performance-based activities. Moreover, with the implementation of LBD module which allows for data triangulation, this study examined the impact of LBD on participants' TPACK development. Specifically, the following research questions were investigated by the present study:

1. What are the ELT teachers' attittudes for computers (TAC) before and after the online ICT in Education course?
2. How did the course mediate ELT teachers' TPACK development?
3. How did the ELT teachers reflect on the online ICT in Education courseimplemented in a LBD framework?

1.5 Significance of the Study

The significance of this study is threefold. Firstly,it has been exceptionally prompting and essential to investigate the English teacher education in CALL all over the world and in Turkey in the same manner, in response to the increasing need for technologically proficient ELT teachers that has become an issue of recognition among education spheres.

In terms of providing background information for this issue, it should be noted that following the initiatives taken by the Turkish Ministry of National Education (MoNE) starting with immediateeducational reforms in 1980s, promoting computer use within schools, supported by the related policy, and the provision of computers and professional development (Akkoyunlu, 2002), in-service training programs were administered to expand teachers' skills in using computer and computer assisted teaching methods (Akkoyunlu&Orhan, 2001). Consequently, as put by Yüksel& Kavanoz (2011), the General Directorate of Computer Education and Services (BILGEM) was founded in 1992 for the goal of integrating information technologies via the use of computers into every level of teaching, including related teacher training, followed by the decision of MoNE to set up computer labs in at least two primary schools in every city and town. Moreover, the same authors

indicatethatsuch progress resulted in the increasing call for teachers, capable of integrating technology into their instruction, a fact which required the response of The Council of Higher Education (HEC) in terms of restructuring of the education faculties through the change in their curricula and integration of technology into their teacher education programs. In the same way, in response to the urgent need for technologically savvy ELT teachers, alternative ways were developed such as the inclusion of instructional technology courses into TEFL training/certificate programs to equip EFL teachers with the required technology skills to integrate into their instruction.However, scarce research in the context of Turkeyin this sense, points out the issues related with teachers' attitudes and practices on effective technology integration into their teaching (Adalıer, 2012; Koç&Bakır, 2010; Topkaya, 2010), with the absence of any study, specifically focusing on in-service EFL teachers.

Secondly, this study is further significant as it is carried out in an online ICT Master's course where instruction was delivered not through face-to-face class meetings, but either asynchronously (email and discussion boards) or synchronously (real time), which is a challenging yet unique opportunity to experience CALL for EFL in-service teachers in Turkey. Therefore, the results and findings reflecting the teaching perceptions and practices of participants thereof may help the CALLfield discern how call integration appeared in an authentic technology environment, and shed light on the understanding of how EFL teachers integrate CALL at such a distinctive setting.

Last but not least, executed within the TPACK framework in an LBD setting,this study is a distinguishing attempt to delineate CALL researchers in their pursuits to design effective teacher education courses that would expand the impact of CALL teachers' learning, adopting and integrating technology in their instruction. The findings can edify CALL experts on the quest of related curriculum and program preparations.

1.6Operational Definitions of Terms

Pedagogical Content Knowledge (PCK): Proposed by Shulman, PCKis described as the knowledge that is employed for transforming subject matter into more conceivable forms for students (Geddis, Onslow, Beynon&Oesch, 1993; Grossman 1990; Shulman, 1987), embroiling an impressive transformation in

teachers' understanding "from being able to comprehend subject matter for themselves, to becoming able to elucidate subject matter in new ways, reorganize and partition it, clothe it in activities and emotions, in metaphors and exercises, and in examples and demonstrations, so that it can be grasped by students" (Shulman 1987, p. 13).

Technological Pedagogical Content Knowledge (TPACK): A framework which, according to Koehler & Mishra (2009), "builds on Shulman's (1987, 1986) descriptions of PCK to describe how teachers' understanding of educational technologies and PCK interact with one another to produce effective teaching with technology" (p. 62) as an emergent form of knowledge that goes beyond all three "core" components (content, pedagogy, and technology).

Learning by Design (LBD): An approach for TPACK development, ''– whereby teachers learn about educational technology by engaging in authentic design tasks in small collaborative groups'' (Koehler and Mishra,2005a, p.99)

Informationand Communication Technology (ICT):A concept which emerged in the 1980's, used to refer to a set of technological tools and resources for the purpose of creating, gathering, storing, retrieving, processing, analyzing and transmitting information (Internet Advisory Board, 2008).

Computer Assisted Language Learning (CALL): A process entailing "the use of computers and other digital technology to enhance language instruction" (TESOL TechnologyStandards Framework, 2008, p. 42)

Chapter 2: Literature Review

To equipteachers with technology integration proficiency, teacher preparation programs inevitably confront the following questions: “what should teachers know abouttechnology” and “how should they learn about it” (Mishra & Koehler, 2003, 2006; Zhao, 2003). Considering the aim of this study tofindthe answers to these questions through the CALL experiences of ELT in-service students who were the participants of an online ICT Master’s course context in Turkey within the TPACK framework through a LBD approach, this section reviews the literature, focusing on particular relevant studies. To clarify, first, empirical research on the CALL teacher education worldwide including the Turkish context is reviewed. Second, a discussion on TPACK as the theoretical framework of this study is presented. In addition, literature on LBD approach for the purpose of tracking a thorough TPACK development is reviewed, followed by a detailed description of the LBD model implemented in the current study.

2.1Teacher Education in CALL

In an ever-changing world, language teacher education has become closely linked with the development of CALL as teachers are the essentials of realizing its educational effectiveness (Hubbard, 2008), determinants of if, how or what technologies are to be used in the classroom (Cuban, 1986; Zhao &Chiko, 2001), considering the significant role of technology use for engaging students in learning (Günüç&Kuzu, 2014). Accordingly, CALL literature indicates that when technology is incorporated into learning, considerable improvement is observed in students’ achievement scores as well as their motivation and attitudes (Cellat,2008; Almekhlafi, 2006; Kozma, 2003), in their note-taking and writing skills (Kılıçkaya, 2004; Chikamatsu, 2003), reading skills (Sakar&Erçetin, 2005), their intercultural understanding and use of language on such social settings (Kamhi-Stein, 2000), and their creativethinking skills (Harris, 1998). The above stated benefits of CALL, clarify that the role of language teacher education is therefore crucial as this may determine the success of the language teachers’ technology incorporation (Hubbard, 2008; Lam, 2000).

2.1.1 Designing teacher education in CALL: how and why?In CALL teacher education, the design, content and approach related with the delivery of the training program is a crucial issue to be considered. Therefore, it could clearly be stated that there is a direct positive link between teachers' earlier experience in technology in a teacher education program and their successful use of technology in their teaching practices (Hernandez-Ramos, 2005). Moreover, research shows the effect of positive experiences in learning and teaching via technology on gaining confidence in CALL, and consequently application of it in teaching (Bauer-Ramazani, 2006; Hong, 2010; Hughes, 2005). In this sense, teacher education programs are required to equip the ELT teachers with "proficiency in the use of computers and multimedia technology to enhance teaching and learning; and development of expertise in the integration of technology, multiple intelligences, and TESOL standards" (Chisholm & Beckett, 2003, p.266). Essentially, as reported by Chapelle and Hegelheimer (2004), teachers are to be cognizant of how to use technology and why. Therefore, it is only through well-organized technology workshops or teacher education programs that teachers can be assisted in sound technology integration (Hong, 2010). To clarify, it can clearly be stated that the best way of learning about technology is through technology, and similarly, as put by Slauti and Motteram (2006), 'teachers need to learn about online learning through online learning'' (p. 89). In the same way, Chapelle (2003) noted that, "the way that students will learn to do applied linguistics with technology is by learning applied linguistics through technology" (p 31). These statements clarify the necessity of using technology in an authentic teaching context while learning technology integration for educational purposes. Basically, CALL teacher education intervention is the key to achieve this goal whileguiding teachers in combining technology with their content and pedagogical strategies.

2.1.2The impact of CALL teacher education programs. Though there is a variety of CALL teacher education programs including online courses along with face-to-face courses (e.g., Bauer-Ramazani, 2006; Jones &Youngs, 2006), introduction of computer technology as part of a second language teacher education course (e.g., Desjardins & Peters, 2007; Kamhi-Stein, 2000), technology workshops (e.g., Rickard et al., 2006) research on the impact of such courses accompanied by a specific coursefocal point has been on how such courses impacted the attitudes and

perceptions oflanguage teachers towards CALL and their confidence in incorporating CALL into their instruction, (e.g. Albilirini, 2006; Arkin, 2003; Aydın, 2013; Bordbar, 2010; Kim, 2011; Lau & Sim, 2008; Meskill, Anthony, Hilliker-VanStrander, Tseng, & You, 2006; Park & Son, 2009; Sun, 2010; Uzunboylu, 2007; van Olphen, 2007).However, there is a limited amount of studies with a focus on seeking theCALL – program – relatedchangesin the teachers' instructional practices (McNeil, 2013; van Olphen, 2008).

Among the majority of research focusing on the impact of technology training on language teachers' attitudes, Meskill et al, (2006) proved that the interactions in an online community was acknowledged by both in-service and pre-service language teachers and consequently led to the increase in their positive attitudes toward CALL and confidence in their technology integration. On the other hand, the studies by Kim (2011) and Sun (2010) demonstrated the positive attitudes of pre-service teachers toward podcasting and/or blogging as a facilitator in their development and proficiency in teaching. Nevertheless, these studies lacked the evidence in regards to the transmutation of such experiences and attitudes into language teachers' instructional practices.

Moreover, it should be noted that, for a sound integration of such activities into teaching practices in a CALL teacher education program, there is a necessity for the combination of theoretical knowledge basis and technology related instructional practices. In this sense, CALL literature offers a few studies demonstrating the application of CALL related theories into practices which would both boost language teachers' development and provide a platform for students' learning (Chao, 2006; Debski, 2006; McNeil, 2013). In the study by McNeil (2013), situated learning activities were suggested into CALL professional development. Accordingly, McNeil (2013) focused on the learning experiences of 21 in-service teachers who were MA TESOL students in a Korean University. He used surveys and questionnaires to investigate the impact of a situated learning training course impact on the CALL skills of teachers. As a result, he argued that the training course had a positive impact on teachers' technology integration skills. However, though the course offered a variety of elements in regards to situated learning environments, he attested that the participants perceived their computer literacy neither assisting, nor reflecting their CALL learning into their instructional language teaching practices. In

sum, CALL teacher education enhances teachers' confidence and positive attitudes towards technology integration (Hegelheimer, 2006; Hoven, 2007; Meskil et al., 2006; Sun 2010), as well as impacting the translation of CALL into their teaching practices (McNeil, 2013; van Olphen, 2008). However, there occurs a mismatch in what the teachers reported in relation to their technology integration and their observed activities (Wong & Benson, 2006). Hence, there seems to be a necessity for the inclusion of performance –based instruments as data sources to supplement self – reported data such as surveys and interviews. Upon the examination of literature on CALL teacher education, the TPACK framework was utilized as a lens for the present study in the pursuit of a more thorough analysis of language teachers' technology competency and integration.

2.2TPACK Framework

Proposed by Mishra and Koehler (2006) to the educational technology field, TPACK framework was intended to provide an understanding forthe knowledge required for teachers' effective technology integration. This study therefore employs this framework as a guide for examining teachers' knowledge and practices on CALL incorporation.

Confiding in Shulman's studies (1986,1987) introducing the concept, Pedagogical Content Knowledge (PCK) relevant to the teaching of specific content, Mishra and Koehler suggested the term TPCK initially, with the insertion of technology knowledge as a fundamental teacher knowledge component of 21st century education. Subsequently, the name was changed to TPACK by Thompson and Mishra (2007), meaning the ''TOTAL PACKage'' as it enfolded the notion that pedagogy, content and technology are not to be dealt with individually, but considered as a whole for sound teaching with technology (See Figure 1)

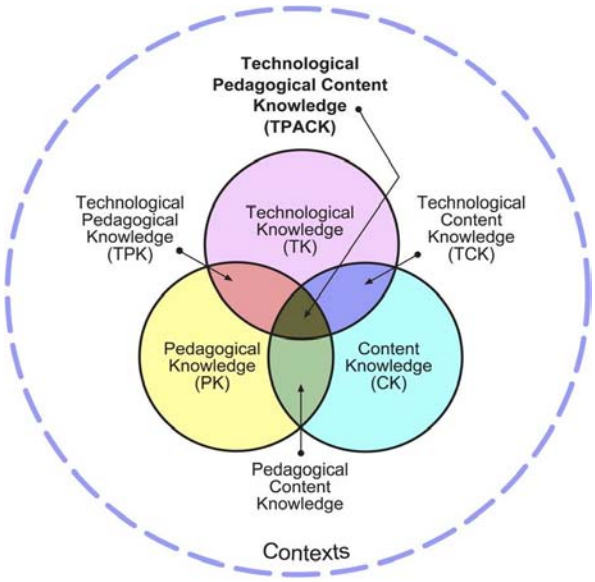

*Figure 1.*The TPACK Framework.byMishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. Teachers College Record, 108(6), 1017-1054.(Copyright, Koehler & Mishra, 2003).

As put by Koehler et al. (2007), integrating technology into instructional practices is a complex issue and it urges a more expansive understanding of complex interaction among multiple factors. Teacher educators are to better comprehend the basic elements that may support or impede technology integration. The TPACK framework proposes the inclusion of the three key knowledge types among teachers, content knowledge (CK), pedagogy knowledge (PK), and technology knowledge (TK), reiterating the significance of interactions and complexities among these three fundamental knowledge domains. To clarify, surpassing the individual examination of these three knowledge domains, as put by Koehler and Mishra (2008), the TPACK framework investigates the new knowledge combinations converging within these three realms of knowledge, namely PCK, technological content knowledge (TCK), technological pedagogical knowledge (TPK), and TPACK, with the awareness that effective and exquisite teaching manifests in this framework.

2.2.1 TPACK knowledge domains. The TPACK knowledge domains and the ‘‘context’’ factor classified by Mishra and Koehler (2006) are described below:

2.2.1.1 Content knowledge (CK). Content knowledge indicates the knowledge on the subject matter (Koehler & Mishra, 2009; Shin et al., 2009). It encompasses the knowledge of facts, procedures, principles and theories in one's subject matter area (Mishra & Koehler, 2006).

2.2.1.2 Pedagogical knowledge (PK). Pedagogical knowledge is associated with the "general skills, beliefs, and knowledge related to teaching, independent of a particular subject area. Knowledge and beliefs about learners, basic principles of instruction, classroom management, and the aimsand purposes of education are all part of general pedagogical knowledge" (Cox 2008, p. 7).

2.2.1.3 Technology knowledge (TK). Mishra and Koehler (2006) explain technology knowledge as:

> the knowledge about standard technologies, such as books, chalk and blackboard, and more advanced technologies, such as the Internet and digital video. This involves the skills required to operate particular technologies. TK includes knowledge of how to install and remove peripheral devices, software programs, and create and archive documents. (p. 1027)

2.2.1.4 Pedagogical content knowledge (PCK). Pedagogical content knowledge refers to the perceptions on "the most useful forms of representation of [content], the most powerful analogies, illustrations, examples, explanations, and demonstrations—in a word, the ways of representing and formulating the subject that make it comprehensible to others" (Shulman, 1986b, p. 9).

2.2.1.5 Technological content knowledge (TCK). Technological content knowledge indicates the understanding of technologies specific to a content area. Cox (2008) states that:

> Technological contentknowledge is the knowledge of appropriate technologies that may be utilized in a given discipline and how the use of those technologies transforms the content of that discipline through representation or the generation of new content or how the content of thatdiscipline transforms or influences technology. It is the knowledge of (a) howtechnologyrepresents content, (b) how technology generates new content, and (c) how content transforms technology. (p. 60)

2.2.1.6 Technological pedagogical knowledge (TPK). Technological pedagogical knowledge is the knowledge of the pedagogical use of technologies independent of any content. It involves the knowledge of affordances and limitations of technologies that can be used in general pedagogical context and of how those technologies' affordances and limitationsimpact or are are impacted by pedagogical choices of a teacher (Cox, 2008; Koehler & Mishra, 2009; Mishra & Koehler, 2006).

2.2.1.7 Technological pedagogical content knowledge (TPACK). Technological pedagogical content knowledge is the knowledge of applying technology, pedagogy, and content simultaneously in the same context. Cox (2008) explains TPACK as:

> The essential features [of TPACK] are (a) the use of appropriate technology, (b) in a particular content area, (c)as part of a pedagogical strategy, (d) within a given educational context, (e) to develop students' knowledge of a particular topic or meet an educational objective or student need. This definition acknowledges the presence and interaction of all three components with particular emphasis onthe use of content-dependent pedagogy. (p. 65)

2.2.2 Significance of context in TPACK framework. Technology integration requires context. To clarify, technology designs which suggest general answers unraveling problems with technology are not sufficient for cogent technology integration in teaching as they disregard the distinctive features of teachers including their viewpoints, skills and characteristics. In other words, technology integration in a given context involves the specific content to be taught, technologies to be applied and styles specific to students and teachers (Mishra & Koehler, 2006). Accordingly, it could clearly be stated that such factors have a significant impact on TPACK based designs and applications, necessitating customized technology designs for specific contents in specific learning environments. In this sense, as put by Cox (2008), a potent TPACK model should as well address the context of that model. While recognizing the context factor, TPACK incorporates technology, pedagogy, and content in one domain as a total teaching package with good quality (Thompson & Mishra, 2007). However, examining the complex structure of TPACK and its development process requires an understanding of its integration to CALL.

2.2.3. TPACK integration into CALL context. It should be noted that while the TPACK framework was not intended for teacher education in CALL, its focus on the interaction of the three knowledge areas, TK, CK, and PK is in natural tandem with the set of technology standards introduced by the Teachers of English to Speakers of Other Language (TESOL) Association. Functioning as a guide to ELT professionals, TESOL Technology Standards (Healey, Hubbard, Kessler, & Ware, 2011) focus on "offering pedagogically solid ways of integrating and using technology in teaching methods" (p. 17). The alignment of TPACK and technology standards for language teachers is clear, considering the four goals thereof: (1) language teachers receive and maintain fundamental technology knowledge and skills for professional purposes; 2) language teachers incorporate pedagogical knowledge and skills into technology to improve language teaching and learning; (3) language teachers implement technology in documentation, feedback, and assessment; and (4) language teachers employ technology to promote communication, collaboration, and efficiency.

Moreover, it is crucial to refer to some frameworks introduced to CALL spheres to investigate teachers' technology integration (Hampel & Stickler, 2005; Hubbard & Levy, 2006; van Olphen, 2008). To clarify, first Hampel and Stickler (2005) proposed a framework focusing mainly on the technology skills, not addressing their content and pedagogy knowledge; in terms of their making connections between what and how they are teaching. This attempt was further developed by Hubbard and Levy's (2006) proposal of a framework focusing on the teachers' both technological and pedagogical knowledge skills, though the twodomains were still is detached and lacking the inclusion of content knowledge. Consequently, the TPACK framework was applied by van Olphen (2008) which provided a contextual basis for this study as well as a practical lens for analyzing the CALL experiences of ELT in-service teachers in the current study. Table 1 illustrates the definitions of the seven constructs within the TPACK framework with intent to ensure a deeper understanding of language teachers' TPACK experience.

Table 1

Definitions of TPACK Framework Domains

Knowledge Domains	Definition	
	Mishra and Koehler (2006)	van Olphen (2008)
CK	the knowledge about the subject matter that is to be learned ortaught	encompasses all necessary elements that help language learners to communicateboth verbally and non-verbally across linguistic and cultural borders
PK	the knowledge about the processes and practices ormethods of teaching	is educational approaches to language teaching that draw from socioconstructivist philosophies to develop students' language and cultural competence
TK	the knowledge about both the standard technologies and more advanced technologies	
PCK	the knowledge about whatteaching approaches fit the content and how elements of the content can be arranged for better teaching	what teachers know about teaching the target language to empower students tocommunicate across linguistic and cultural borders
TCK	the knowledge about the manner in which technology and content influence and constrain one another	the need to identify which specific technologies are best suited for addressing language learning and howlanguage teaching dictates or changes the choice of technology
TPK	the knowledge about howteaching and learning changewhen particular technologies are used	entails a deeper understanding of the constraints and affordances of technologies and how they function in language teaching
TPACK	the knowledge that emergesfrom an understanding of an interaction of content, pedagogy,and technology knowledge.	it is through an understanding of this interplay among technology, content,and pedagogy that we can understand how linguistic and cultural concepts arerepresented using technology, and howsuch representations facilitates orhinders the acquisition of language

In all, such attempts in the design and implementation of TPACK reflect the efforts in developing comprehensive teacher education programs to prepare teachers for technology integration in their instructional practices. Nevertheless, in order to

examine the complex structure of TPACK and its development process in CALL as a contextual basis requires a thorough assessment of such competency.

2.2.4 Measuring TPACK competency. Following the emphasis and conceptualization on TPACK framework constructs, focus of recent research has been on the use of such framework on the pursuit for reaching an understanding of development in teachers' technology integration. Accordingly, assessment tools were developed in order to measure teachers' TPACK competency. Initially, a one-time survey of 24 items implementing a five-point Likert scale was introduced and applied by Koehler and Mishra (2005a) to identify the changes in teachers' perceptions of the relationships between technology, pedadogy, and content within a LBD course and it was found that the participants exhibited a strong TPACK understanding upon this one-semester course. Following that study, Archambault and Crippen (2009) developed a survey on f K-12 online distance educators with findings revealing significant increase of PK, CK, PCK the participants, yet, with TK increase being not significant. Finally, Schmidt et al. (2009a, 2009b) extended the two previous studies, developing a more potent survey which was suitable for application in a variety of content areas. Accordingly, they applied it on pre-service teachers as a pre- and post-study survey in an instructional technology course and found statistically significant increase in all seven knowledge domains. In the present study, the survey adapted from Schmidt et al. (2009) was implemented in assessing the in-service ELT teachers' TPACK competencies.

Furthermore, it should be noted that not much research exists focusing on the impact of such courses on assessing teachers' TPACK development via their actual classroom practicesthough previous literature has shed significant light on how teacher education programs influence teachers' perceptions of and attitudes toward CALL integration in the classroom.Therefore, together with the TPACK survey adapted from Schmidt et al (2009), also the TPACK codebook by Baran, Wang, Tai, Schmidt-Crawford, Thompson, Kara, and Yurdakul, (2012) which was modified by Tai et al. (2014) (See Table 7) was used as another assessment tool in coding and analyzing the course assignments of the ELT in-service teachers for tracking their TPACK development in the present study.

2.3LBD Approach

Highlighting the combination of interplay among technology, pedagogy and content, TPACK construct seeks to interpret ‘‘how teachers’ understanding of technologies and pedagogicalcontent knowledge interact with one another to produce effective teaching with technology”(Koehler & Mishra, 2008, p. 12). In this sense, as suggested by Pope, Hare and Howard (2005) “teachers need opportunities to learn with the technology by being exposed to authentic, learner-centered activities that allow them to construct their own understanding of the learning outcomes” (p.579).In other words, participants involved in the administration of this framework play a central role in theapplication and reflection steps making connections between knowledge and practice. Accordingly,Lawless and Pellegrino (2007) noted:

> A design-based approach affords teachers the opportunity to learn how to use specifictechnologies situated in the context of their curricular needs. As a result, teachers takemore ownership of the resources, have higher confidence in integrating the unit as a teaching tool, and are more likely to believe that the curriculum resources will have apositive impact on student achievement. (p. 594)

Proposed by Kolodner and her colleagues (2003), Learning by design (LBD) is a learner-centered instructional theory that engages learners in the designing of an artifact for a real-world context whereby learners build their understanding and meaning toward a topic or concept (Han & Bhattacharya, 2001). Within authentic problem solving contexts,LBD provides the space for teachers to use technology and to explore “the rich connections between technology, the subject matter (content), and the means of teaching it (the pedagogy)” (Koehler & Mishra, 2005a, p.95). LBD was developed based on the theoretical practices of social constructivism (Koehler & Mishra, 2005a) and constructionism (Han &Bhattacharya, 2001); case-based reasoning (Kolodner, 1997), problem-based learning (Han & Bahttacharya,2001; Koehler & Mishra, 2005a; Kolodner et al., (2003) and design theories (Koehler & Mishra, 2005a). While involving learners in the designing of a material in a learning context, a LBD environment immerses learners in the commmunication between “ideas and the world, theories and their application, concepts and their realization, tools and goals” (Koehler & Mishra, 2005a).

According to Kolodner and her colleagues (1998), there are seven key components that constitute a LBD environment. These components are:

- Authenticity: tasks based on real-world applications
- Multiple contexts for design activities
- A balance of, scaffolded challenges with open-ended design tasks
- Rich, varied feedback for designers
- Discussion and collaboration
- Experimentation and exploration
- Reflection

While current studies (Koehler & Mishra, 2005a; Han & Bhattacharya, 2001; Kolodner et al. 2003)have maintained information worthwhile on how LBD could be used for improving learning, research examining on how LBD could be employed in guiding the design of technology integration programs for teachers is scarce, not to mention the absence of any related study in CALL field. Following, the current trends involving the LBD model in the literature with LBD having been implemented in a variety of setting from K-12 classrooms to higher education (e.g.Fessakis, Tatsis, & Dimitracopoulou, 2008; Kolodner et al., 2003), there occurred a need for its adaptation by Lu, Johnson, Tolley, Gillard-Cook, and Lei (2011). This adapted version of LBD model was subsequently customized in the current study for the purpose of tracking and evaluating ELT in-service teachers' TPACK development, which will be described in detail within the subsequent sections of this chapter.

2.3.1 Description of the LBD model. As suggested by research on teacher education, efficient models for teacher professional courses should entail an environment involving active learning and joint participation with an emphasis on content (Desimone, 2009). In this study, to track and evaluate participants' TPACK experience involving their attitudes toward CALL and technology integration practices, a LBD model based on Kolodner's LBD theory (2003),adapted by Lu et al. (2011) was modified for the specific study setting. Figure 2 illustrates the Original

LBD cycle by Kolodner and his colleagues (2003), whereas Figure 3 demonstrates a representation of the adapted LBD model by Lu et al. (2011).

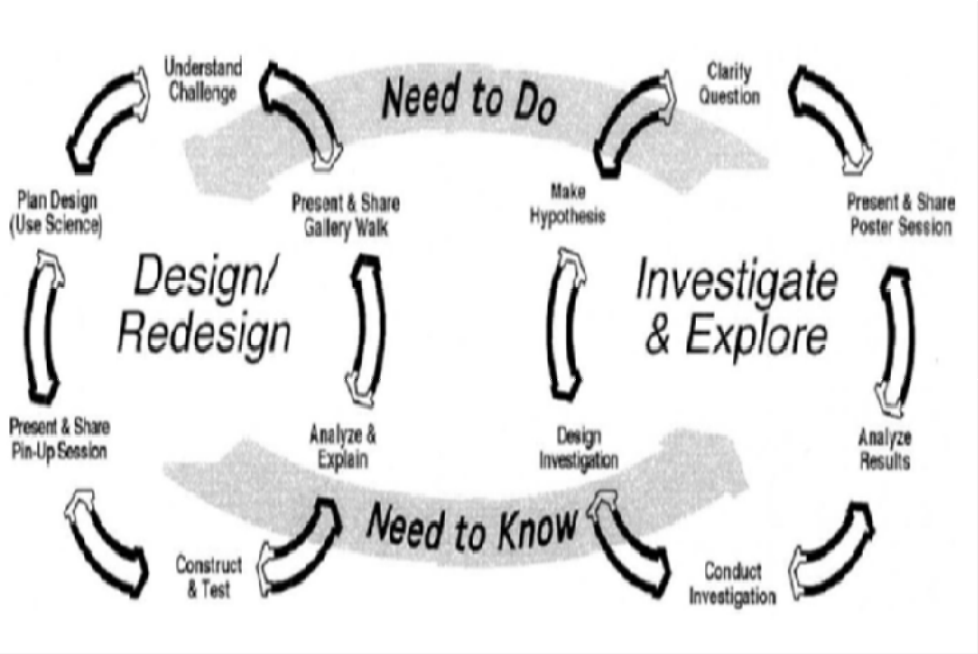

Figure 2. ‘‘The learning by design cycle’’by J. L. Kolodner, P. J. Camp, D. Crismond, B. Fasse, J. Gray, J. Holbrook, S. Puntambekar, & M. Ryan, 2003, Journal of the Learning Sciences, *12*(4), 495-547. Copyright, Kolodner et al., 2003.

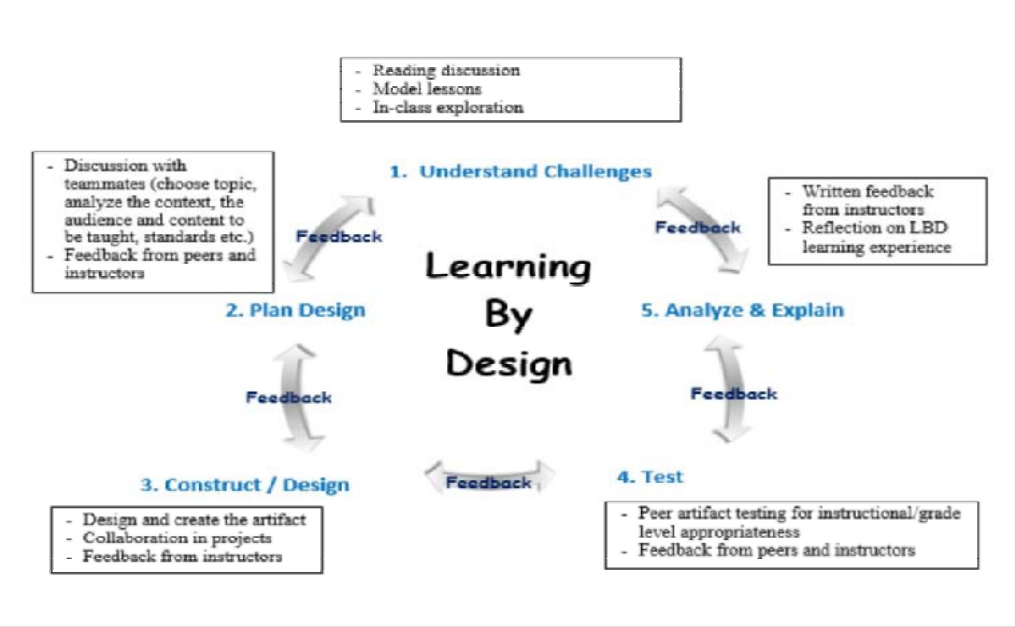

*Figure 3.‘‘*An LBD model for preservice teacher technology preparation’’ (Lu et al., 2011, p.49). Copyright Lu et. Al., 2011.

2.3.2 LBD Activities. The course set-up was suitable for the design and implementation of activities in the LBD environment, representing actual instructional challenges involving those minor activities such as creating a blog, webquest or CALL lesson plan and a major activity which was a CALL project. The LBD model represented the execution of activities as follows:

Understand Challenges: In this step, ELT in-service teachers were informed about the design challenge in regards to the design of an instructional technology artifact on an actual teaching task. Specifically, discussions on readings provided teachers with further understanding on how technology can be applied for instructional purposes.

Plan Design: In this step, ELT in-service teachers were given specific assignments regarding their projects. They either worked individually or in groups to plan the design for the instructional artifact. Depending on the requirements of a project, the ELT teachers had to select, analyze, and decide on their audience, content, instructional methods and technology. Project teams were also enabled to communicate their preliminary ideas on their projects.

Construct/Design: In this step, ELT teachers started to design and construct their instructional artifact or solution in accordance with the Plan Design step.

Test: In this step, ELT teachers applied their design in a real teaching context. In mini projects, however, they tested their products with whole class via interactive presentations during synchronous gatherings with the instructor and the other participants. In this way, they could receive feedback both from the instructor and their peers.

Analyze and Explain: ELT teachers were required to provide a coherent description of their design experience through written reports and various forms of reflection. They explained the information they acquired out of the project, reflected on the outcomes of the test step, recommended attainable redesign plans, and connected their learning experiences with their future teaching path.

During the whole LBD cycle, ELT in-service teachers were provided with miscellaneous forms of feedback concerning their design or solution including synchronous (in-class) feedback from the instructor and peers, and asynchronous

feedback from the instructor and peers in written form. Table 2 encapsulates the sample instructional activities and how the activities can be implemented in the context in each step.

Table 2

An LBD Model for In-service ELT Teacher Technology Preparation, adapted from Lu et al. (2011). Copyright, Lu et al.(2011).

LBD Steps	Sample Instructional Activities	Application in the Context
Understand challenges	- Cast project in context ofclassroom applicability/coursegoals. - Reading discussion. - Model technology integratedlessons (ELT teacherstake on student role).	- ELT instructorsframe or demonstrate effective use of technology in classroom contexts, reflecting on teacher'splanning/implementation process. - ELT teachers experience lessons from student perspective
Plan design	- Discussion with groupmembers during mini-projectplanning/creation. - Feedback from peers andinstructor.	- Participants are engaged in solving authenticinstructional tasks. - Authentic scenarios address the integration oftechnology and lining up with content andpedagogy.
Construct / design	- Design and creation of theartifact. -Collaboration with group members. - Feedback from the instructor.	- Emphasis on technology use for instructional purpose in authentic contexts.
Test	- Feedback from peers and the instructor. - Peer artifact testing for instructional/grade level aptness.	- Emphasis on testing artifact based onappropriateness of instructional solution. - Emphasis on helping participants articulate therelationship between content, pedagogy, andtechnology.

Analyze & explain	- Written feedback frominstructor. - Reflection on artifact'sapplication and on the exercising ofinstructional methods.	- Emphasis on helping participants articulate the relationship between content, pedagogy, andtechnology. - Reflection supports participants in connecting their in-classlearning experiences with their futureteaching tasks.

2.3.3 Implementation of LBD.A mini project and the course project will be presented here in order to demonstrate how the LBD activities were applied in this ICT course setting. The topic was Webquest. Prior to class, the participants read the related given articles that provide examples of how such a task-based technology tool could be applied in teaching. For the reading discussion, students exchanged ideas for using Webquest in their individual learning. As for modelling, ELT teachersin groups took on the role of students in completing a Webquest assignment. With the assignment, the ELT teachers needed to followstep-by-step directions for creating this technology tool by collecting, analyzing and displaying information gathered with/from their classmates. Prior to the model lesson, the instructor modelled the task by assisting in the building of the student/teachers' content knowledge by showing the standards that the task addressed, providing them with information on the related resources and by clearly stating the desired outcomes with respect to the research on the use of technology in Task- based language teaching. During the testing step, the student/teachers tested their products with whole class via interactive presentations during synchronous and asynchronous communication on the online course platform with the instructor and the other participants. In this way, they could receive feedback both from the instructor and their peers. In these gatherings, the instructor provided directions when necessary through scaffolding, as well as administrating student /teachers' interactions throughout the lesson. At the end of the lesson, the student/teachers also reflected on their own practices and instructional decisions with the purpose of assisting an understanding of such a lesson in their students when implemented in their actual classroom practices. Also, accompanying the individual assignments, such as task of creating Webquest as a groupwork allowed them the opportunity of peer collaboration, discussion and feedback.

In this LBD application as a mini course project, students often began by reading about the given assignment, and its use in actual classrooms, having little or

no experience with that specific technological tool, consequently acquiring the the competency to use it in a variety of ways with their students in the future. They also received feedback from their peers accompanied with cooporation and discussion thoroughout the process.

In the same way, together with these mini project assignments including creation of Web 2 tools such as Webquests, or preparing a CALL lesson plan, scaffolding was also provided for teacher/students for their final course project which was a mini Action Research Project presentation. Instruction was provided prior to the task which was to create and present a CALL Project as a mini action research. In pairs or groups, Student teachers were to first identify a problem trying out a new CALL method or tool, do some readings about the issue, create research questions, and by using the specific technology to solve the problem, collect data, by finally analysing it and providing results, and suggestions. The groups selected related issues and worked collaboratively, drafting and submitting their study outline. Upon the review of these assignments by the instructor, they received feedback thereof and additional scaffolding as necessary to complete their projects. This process continued with the submission of the other parts of the project such as methodology. On the week of the class, the groups presented their projects to their classmates. The whole process in regards to this course project was intended to prepare student/teachers for this presentation as the instructor modelled and assisted them during the whole process on how to identify the problem, develop a solution which is informed by existing theoretical frameworks. In this way, the ELT in-service teachers were provided with a unique opportunity to develop knowledge and skills necessary for them to integrate information and communication technology into their classroom practices which is supported by the literature. Accordingly, as put by Herrington, McKenney, Reeves and Oliver, (2007), "A well-described theoretical framework provides a sound basis for the proposed solution, because theory caninform practical design guidelines"(p.6).

In sum, the literature encompassing teacher education in CALL, TPACK as a theoretical framework and LBD model in terms of putting this theory into practice were reviewed in this chapter. To begin with, the significance of CALL in language learning and teaching and specific emphasis on teacher education was reviewed. Accordingly, literature on why and how to design CALL teacher education courses

was discussed, indicating research on the impact of CALL teacher education, which heavily relied on teachers' perceptions with inadequate foci on their technology integration practices necessitating a framework for improving the practical impact of such courses. In this sense, the need to include performance-based data instruments into the studies to examine how teachers adopt technology into their practices was indicated. Next, literature on TPACK framework including integration of TPACK into CALL context and how to measure the competency related to this construct was reviewed. Additionally, based on the literature review, a gap in the design and implementation of teacher education in CALL was identified. Finally, LBD model has been described in detail as it provided a lens through which the TPACK experiences of ELT teachersin CALL were explored in this study.

Chapter 3: Methodology

3.1 Philosophical Paradigm

Research supports the direct significant impact of an effective CALL teacher education program on teachers' acquisition and achievement of CALL competencies (Bauer-Ramazani, 2006; Chisholm & Beckett, 2003;Hubbard, 2008). The significance of such programs is not only due to their role in improving language teachers' attitudes and perceptions towards technology integration, (e.g. Albirini, 2006; Aydın,2013; Kim, 2011; Meskill et al, 2006;Uzunboylu 2007),but also to their technology integration skills (e.g. McNeil, 2013).

In the task of developing these programs where teachers would be deemed as professionals capable of confidence in incorporating technology into their practices"rather than solely functioning as computer experts, researchers began focusing on creating authentic contexts. (e.g. Chao, 2006; Egbert, 2006; Hampbel& Stickler, 2005). Accordingly, to articulate CALL by doing CALL, as put by Chapelle (2003), was noted crucial towards acquiring skills in combining technology with content and pedagogy.

Additionally, scholars emphasized the need to provide 21st century language teachers with essential skills to successfully incorporate technology in their classrooms in order to maintain effective and successful teaching (Chapelle&Hegelheimer, 2004; Kessler & Plakans; 2008; Levy & Stockwell, 2006). In this sense, as noted by Hughes (2005), there is a firm link between the changes in teachers' stance against technology, resulting in efficient use of it and their learning of subject matter (content) knowledge, pedagogical knowledge and content knowledge.

Essentially, it can clearly be stated that technology integration in instructional practices necessitates the uncovering of the complex interactions among a variety of constructs including technology, pedagogy, content and context (Koehler et al., 2007). Hence, Building on Schulman's (1986) theory proposing the concept PCK, Mishra and Koehler (2006) introduced a new framework called TPACK that particularly focuses on the interplay among pedagogy, content, and technology

inorder to establish a common language among scholars and sustain systematic research of technology integration to teaching.

Considering theabovestated issues, though the TPACK framework points out the crucial constructs of teacher knowledge required in technology integration, there is still a requirement for practice-driven interventions in the design and exertion of CALL teacher education courseswhich will ensure the teachers' adoption of technology in their classroom practices.

3.2 Research Design

The present research is basically a qualitative case study employing a quantitative approach as well to support and triangulate the data therof. Moreover, case study methodology was employed in this study. Case study is ''an exploration of a 'bounded system' or a case (or multiple cases)over time through detailed, in-depth data collection involving multiple sources or information rich in context'' (Creswell, 1998, p.61), ''to study an individual, an institution, or any unique unit in a setting as intense and as detailed manner as possible'' (Salkind, 2008, p.127).

This study adopted a case study approach ensuring the use of multiple sources combining both qualitative and quantitative data– an approach which not only was useful for testing whether scientific theories and models truly work in the real world, but alsofacilitateddata triangulation, eventually providing multiple perspectives to investigate the complex nature of TPACK development. The quantitative data was derived through survey questionnaires before and after the ICT course for ELT teachers. The qualitative data were collected from interviews and document analyses of LBD artifacts, online discussions and interviews. Findings from the qualitative and quantitative data analyses enabled the researcher to deeply represent the participants' TPACK experience including their attitudes toward CALL and technology integration practices.

3.3 Research Context

This section is to provide detailed information about the research context including the study setting with description of the participant ELT teachers.

3.3.1 Setting. This research was conducted in an online educational technology course, called, ICT in Education, delivered by one instructor, within the department

of English language teaching in the graduate school of educational sciences for Master's students at a private university in Turkey, in Fall 2014. The course instructor is an Associate professor in the MA ELT program with a Second Language Acquisition (SLA) and Information technologies (IT) background. The ICT course aimed at presenting and discussing the theories, frameworks, and practices of computer- and web-based applications in foreign/second language learning, CALL, history of CALL, paradigms, theories and research in regards to the use of technologies in language teaching. In this course, the students were expected to: In this course, students were expected to:

In this course, students were expected to:

• Develop an understanding of early and current research and practices in computer assisted language learning and teaching (CALL/T)

• Evaluate a variety of approaches that relate to CALL/T

• Develop an understanding of pedagogically sound technology integration into language teaching

• Identify and locate appropriate resources, software, and tools for second language learning and teaching

• Critically discuss, analyze, and evaluate strengths and weaknesses of various CALL research, activities, practices, tools and resources.

In addition, students gained practical experience in pedagogical applications of computers, including using and evaluating various software, websites, and Web 2.0 tools while exploring those various technology options and their implementation in teaching and learning languages by focusing on all language skills (reading, writing, listening, and speaking).The course assignments included (1) Online discussions, (2) Article presentation, Task and Discussion Leading, (3) Homework Assignments (e.g. attending a Webinar or Conference and writing a one-page reflection, being a member of a Listserv, creating a blog/website with a collection of ELT related resources and materials, CALL lesson plan, Webquest, Glogster poster, and VoiceThread audio discussion task), (4) CALL Project (Mini Action Research Paper).

3.3.2 Participants. The participants involved 13 volunteers out of 30 in-service ELT teachers enrolled in this 15 week study encompassing the whole Fall 2014 semester in which ICT inEducation course was delivered. The study employed a volunteer sampling process to recruit 13 of 30 course attendants who volunteered totake all four surveys (TPACK & TAC pre-/post-study surveys) throughout the semester. Seven (7) females, and six (6) males, participants' ELT experience ranged from 2 to 13years teaching in various settings including K-12 schools, Language scools and Higher education institutions.

3.3.2 The researcher's role. Being a former participant/student of the ICT in Education course in Fall 2013 semester, a year before the present study, the researcher had prior familiarity with the course contents and learning outcomes. Though during the year when she took the course, it was not fully online, yet, delivered in face-to-face settings with online gatherings at times, the researcher had prior information about the theoretical and practical objectives of the course which facilitated her research implementation. During the study, the researcher was provided by the course instructor with the opportunity to access the course learning management system, an online learning platform where the course participants gathered and realized all interactions including synchronous/ascynchronous communication such as preparation, submission, and presentation of course related assignments. Additionally, the course instructorprovided her with feedback samples related with the students' course assignments which enabled the researcher to have a deeper prespective of the practices within the duration of the course.

3.4 Procedures

This section will first provide a detailed description of data collection procedures which are pre-/post study surveys, document analysis of participants' course materials, and interviews, followed by the explanation of data analysis procedures.

3.4.1 Data collection procedures. Data sources for understanding the participants' CALL perceptions and practices in the online ICT master's course were: (1) students' self-perceptions about their TPACK collected with a survey adapted from Schmidt, Baran, Thompson, Koehler, Mishra, and Shin (2009), (2) and their attitudes toward computers collected with a TAC survey adapted from

Christensen and Knezek (1998), (3) Document analysis of LBD artifacts including course artifacts (CALL Lesson Plan & Action Research Project) and written discussions from the course discussion board, and (4) Interviews. The following sections provide detailed information in regards to each data collection method conducted in this study.

3.4.1.1 Pre- and post-study survey.Two types of surveys: TPACK survey adapted from Schmidt et al., (2009) and Teacher Attitude toward Computers (TAC) adapted from Christensen and Knezek (1998) (*see appendix 1 and 2*)were administered to all ELT in service teachers participating in this study both before and after the intervention. The participants were provided with the links to the pre-TPACK and TAC surveys the course LMS system and asked to take the surveys until the end of Week two. The post –study surveys were to be taken by the final week (Week 15) of the intervention.

3.4.1.2 TPACK survey. The TPACK survey has 40 items in total, including 7 knowledge domains. The overview of this survey is presented in the table 3 below.

Table 3
The Overview of TPACK Survey

No	Domain	No. of item	Exemplary item
1.	TK	6	I know how to solve my own technical problems. I keep up with important new technologies.
2.	CK	6	I have sufficient knowledge about speaking. I have sufficient knowledge about writing.
3.	PK	7	I can use a wide range of teaching approaches in a classroom setting. I know how to organize and maintain classroom management.
4.	PCK	4	I can select effective teaching strategies to guide student thinking and learning for listening skill. I can select effective teaching strategies to guide student thinking and learning for reading skill.
5.	TCK	4	I know about technologies that I can use for understanding and learning speaking skill. I know about technologies that I can use for understanding and learning writing skill.
6.	TPK	9	I can choose technologies that enhance the teaching approaches/strategies for a lesson. I can adapt the use of the technologies that I am learning about to different teaching activities.
7.	TPACK	4	I can teach lessons that appropriately combine listening, technologies and teaching approaches. I can teach lessons that appropriately combine writing, technologies and teaching approaches.

The below illustration shows the reliability analysis of the scale. It has been noted of very high reliability for TK,CK,PK,TCK, TPK ve TPACK, and high reliability for PCK.

Table 4
Reliability of Sub-components of TPACK Survey

Sub-variables	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	Number of Items
TK	0,961	0,962	6
CK	0,945	0,944	6
PK	0,929	0,930	7
PCK	0,785	0,786	4
TCK	0,929	0,933	5
TPK	0,953	0,954	5
TPACK	0,969	0,968	7

3.4.1.3 TAC survey. The TAC survey has 22 items in total with two sub-variables: enjoyment and anxiety. The enjoyment sub-variable has 12 items, while the anxiety sub-variable has 10 items. The overview of this TAC questionnaire is presented in the table 5 below.

Table 5
The Overview of the TAC Survey

	Domain	No. of item	Exemplary item
1	Enjoyment	12	I think that working with computers would be enjoyable and stimulating. I enjoy lessons on the computer.
2	Anxiety	10	I get sinking feeling when I think of trying to use a computer. Working with a computer makes me feel tense and uncomfortable.

Table 6
Reliability of Sub-components of TAC Survey

Sub-variables	Cronbach's Alpha	Number of Items
ENJOYMENT	,862	12
ANXIETY	,603	10

The above table illustrates the values related to the reliability analysis of the TAC scale. Accordingly, the scale has proved to be of high reliability for enjoyment whereas it is high for anxiety.

3.4.1.4 Document Analysis. Document analysis included the analysis of the course assignmentswiththe analysis of course artifacts – namely CALL Leasson Plan (W12) and Action Research Project (W13) – and online discussions on the online course management. Specifically, samples from the discussions on CALL research (W3), CALL Input (W4), Glogster task (W5), Webquest task (W6), Storybird reflections (W8), Smartboard and Second Life tasks (W11) were chosen for analysis. It should be noted that instead of participants' real names, pseudonyms were used as a means to provide anonymity and confidentiality in the present research.

These course materials were coded and analyzed using the Baran et al. (2012) codebook, modified by Tai, Crawford, and Wang (2014) (See Table 7).The codes are the representations of the TPACK competency the teachers demonstrated in regards to all seven knowledge domains within the TPACK framework

Table 7
Sample Codes from the Baran et al. (2012) Codebook Modified by Tai et al. (2014)

Code	Full Code	Definition	Example(s)
100.1 TK_Emerging 100.1	Usingemerging technologies	Teacher is using emerging technologies (e.g.Wiki, Facebook, Skype, Blog) in the classroom, notjust telling about it. So students are using the technology to collaborate and interact with eachother or someone else.	CH used Wiki, Google Earth. and Voicethread in accordance with her goals. Activities and projects include a combination of those selected technologies (CH Ob.1 p.2 and p. 5 DS) We're also working on a monster project which is a global project we're working on with people from different countries, different states. So we skyped through that. (CH/In. 1 p. 20)
200. PK_Manage	Managing the classroom	Teacher uses management skills to control theclassroom. (i.e., discipline, routines, rules, following directions, time management, behavior modification, grabbing students' attention.)	CH used several strategies to maintain classroom management (e.g., Stop, Look. Listen....5,4,3,2,1 countdown, phrase "Think on your feet) (CH/Ob. 1 - p. 2 (T) DS; In order for CH to get students' attention: She used some strategies like "Hands off the mouse - I am talking with you." (CH/Ob.1 - p.5 (P) EB)
401. TCK_Match-Affordance	Matching the affordances of technology to content being taught	Understanding what specific attributes (e.g., social, cognitive) technologies have that change the way learners practice and understand content. (Best toolfor the task.)	Well we've been using Google Earth to start every lesson in social studies so far this year. So I've used it and the kids have asked when they got a chance to use it too. So, I just thought that was a great way to introduce it and move them into the independent use of it (CH/In1 - p.18) For science, we use a lot of, I mean I still use video clips to teach a lot of the science content.Because it is so abstract and using like NASA website for our solar system. (CH/In1 - p.23)
600. TPK_Prepare Materials	Preparing instructional materials with technology.	Creating instructional materials with technology to use for teaching. Examples include setting up technology platform (e.g., wiki, web page, blog), supplemental materials (e.g., worksheets, tutorials, locate instructional videos). (Note: This code has nothing to do with students/learning.)	Prepares materials for instruction- CH did a lot to prepare materials for class; (e.g., created wiki, made changes to her class web site to include instructional videos) (CH/Ob. 1 - p. 3 (T)DS) Made tutorials for instructions - CH posted video tutorials on her class website for students to access if they needed instructional help with making the movies (CH/Ob. 2 - p. 11 (T) DS) Web page on steps of digital storytelling... Teacher Web Page. CH provided a reference for students to access on her Web Page. (CH/Ob. 2 - p. 11, (T) DS)
705. TPACK_Resources-content	Using resources (e.g., content & technology) thatare collected overtime to teach.	Using resources (e.g., content & technology) that are collected over time, including drofessional development, workshops, conference, self-learning, etc. to teach the planned lesson in classroom.	Well we've been using Google Earth to start every lesson in social studies so far this year. So I've used it and the kids have asked when they got a chance to use it too. So, I just thought that was a great way to introduce it and move them into the independent use of it. The wiki we actually created for 505 and then I adapted it for my own class. (CH/In1- p.18) (CH/In1- p.21) I did adapt the wiki from 505 to more what I was specifically wanting for my kids to do(CH/In1-p. 21)

3.4.1.5 Interview. Interviews with two volunteering ELT in-service teachers aimed at acquiring in-depth understandings on these participants' responses from the surveys and perceptions on their learning experiences throughout the course. Interviews were held withonly two of the thirteen volunteers due to the fact that they were the only ones with whom the researcher was able to contact because of the work overload of the other participants who were in-service ELT teachers with busy work schedules apart from the master's classes. The interviews with the two volunteers were held via Facebook video chat on the pre-determined schedules each of which lasted 8 minutes and 20 minutes. They were recorded on iTalk application and transcribed and coded accordingly. During the semi-structured interviews, to allow for freedom of digression (Mackey & Gass, 2005), pre-determinedquestions were asked to have the participants' perceptions about their CALL integration experiences upon the completion of the online ICT course.

3.4.2 Data analysis procedures. The data collected for this study was analysed first quantitatively and then qualitatively to investigate whether and how LBD model was effective in assisting in-service ELT teachers' TPACK development in an online ICT course. It should be noted that both quantitative and qualitative data use while determining the effectiveness of technology enhanced programs is advocated by research (Kay, 2006; Lei, 2010). Quantitative analysis was employed to analyze the surveys via descriptive statistics, paired t-test, andrepeated measures. Qualitative analysis was realized by transcribing, generating categories through coding, and interpreting collected from interviews, online discussions and activities of participants to support and/or explain the test results by using (See Table 8).

Table 8
Research Questions, Data Collection and Data Analysis

Research questions	Data collection methods	Data collected	Data analysis technique
What are the ELT teachers' attitudes for computers (TAC) before and after the ICT in Education course?	pre-/and post-study TAC survey (adapted by Christensen and Knezek, 1998)	in-service ELT teachers' self-perceived attitudes towards computers before and after taking the online ICT course	Paired sample t-test
How did the ICT in Education course mediate the ELT teachers' TPACK development?	pre-/and post-study TPACK survey (adapted by Schmidt et al., 2009)	in-service ELT teachers' self-perceived TPACK before and after taking the online ICT course	Paired sample t-test
	document analysis of LBD artifacts (with TPACK codebook adapted by Tai et al., 2014)	in-service ELT teachers' course Project proposals and final reports and CALL Lesson Plans	Qualitative content analysis
How did the ELT teachers reflect on the online ICT in Education course implemented in an LBD framework?	Analysis of online discussions interviews (with LBD Model modified by Lu et al., 2011)	in-service ELT teachers' reflections and opinions about their experiences in the online ICT course	Qualitative data analysis

3.5 Trustworthiness

As described by Savin-Baden and Major (2010), trustworthiness of a research is "the process of checking with participants both the validity of data collected, and that data interpretations are agreed upon a shared truth. It is evidence of research

accountability, and involves both integrity and rigour" (p. 178). In the pargraphs below, the trustworthiness of this study is discussed in detail, based on the four major criteria identified by Guba and Lincoln (1981): credibility, transferability, dependability, and confirmability.

First, the credibility criteria seks the answer to the question of "has the researcher accurately represented what the participants think, feel, and do and the processes that influence their thoughts, feelings, and actions?" (Lodico, Spaulding, & Voegtle, 2010, p.169). Accordingly, Guba and Lincoln (1981) explained that in order for a study to be credible, its analyses, interpretations, and formulations should be believable. In the current study, the researcher being a former participant of the study context, the course ICT in Education, was already engaged in the process due to the development of an early familiarity with the culture of the setting. Also instant access to the online site where the synchoronous and asynchronous communications occurred and the whole course process was executed provided the researcher the opportunity to track all interactions thereof. Moreover, by involving the use of different methods via triangulation assisted in the compensation for the researcher's individual limitations throughout the present study, improving credibility.

Secondly, a transferability criterion refers to the generalizability of data across contexts. Although the results out of this research are unique to the case being in this case study, rather than reaching general results, the aim is to expand and extend the TPACK literature via providing a thick description of this phenomenon, with supporting in-depth examination of previous research findings. From this perspective, the study is to provide valuable insight and could therefore be transferred into those contexts for further exploration.

Being the third criteria, dependabilityfocuses on the question whether the study can be conducted again "under the same circumstances in another place and time" (Guba & Lincoln, 1981, p.377). The present research had clear steps to be followed, with all materials used in the study being easy to prepare and having been placed in the Appendices section at the end of the study. In that sense, the study can be applied in different contexts, though it should be noted that different results might be acquired due to the case differences.

Finally, importance of confirmability is closely linked with its ensuring real objectivity, referring to whether findings were reported objectively without any bias via data triangulation. Following the mixed methods design, the present study affirms the presence of this criteria with analysis of self-reports from TPACK and TAC surveys via t-tests, document analysis of performance based LBD materials such asonline discussions and interviews.

3.6 Limitations

In spite of the fact that the current study attempted to explore what an effective teacher education course requires in relation to its design and implementation and its impact on teachers' CALL integration through TPACK framework following a LBD approach, the following limitations should be taken into consideration while interpreting the results.

First, since 13 students attended the study, findings are representative of a specific population, thus, might not be generalized. Nevertheless, the current research was a case study with the case involving 13students. Moreover, the study did not aim to generalize the findings but to provide an in-depth analysis of the case for expanding and extending the literature on development TPACK, which is put by Mishra and Koehler (2006) as a complex, multifaceted and situated construct.

Additionally, the researcher did not observe participants' teaching and CALL integration prior to and after the ICT course. Observing participants' CALL integration in a variety of different settings and schools of theirs would have contributed to amoregeneral understanding of the current state of CALL teacher education in the Turkish context.

Chapter 4: Results and Discussion

This chapter reports and discusses the results from the study, focusing on how theLBD learning environment provided in an online ICT in Education Master's coursemediated participants' TPACK experiences in CALL teaching. In the study, the effectiveness of LBD on the CALL experience of 13 (of the 30) participants who voluntarily participated in the pre- and post-surveys was examined from three main perspectives addressed in the research questions: (1) whether an LBD environment was effective in changing the ELT in-service teachers' Attitudes Towards Computers (TAC); (2) whether an LBD learning environment was effective in helping ELT in-service teacchers construct TPACK; (3) how the ELT in-service teachers perceived the effectiveness of LBD. Both quantitative (surveys) and qualitative (interviews and online discussions) data were analyzed to answer the questions. The LBD environment was foundto have a positive impact on participants from all three perspectives. The results are presented and discussed based on these three perspectives.

4.1 What are the ELT Teachers' Attitudes for Computers (TAC) before and after the ICT in Education Course?

The table below compares the total scores gained out of the pre- and post-TAC surveys applied on the participants to measure any possible change in their attitude towards computers with the formation of a paired samples t-test. The t-test refers to a statistical test that is used to determine whether there is a significant difference between the mean or average scores of two groups. To examine if the participants' attitudes have changed after taking the ICT course, the pre- and post- scores of TAC survey were compared using the paired sample t-test.

Accordingly, no significant relationship was observed in terms of the LBD learning environment effect on the participants with Enjoyment variable ($p=0.447 > .05$), and Anxiety variable ($p=1 > .05$).

Table 9
Total Scores out of the Pre- and Post-TAC Surveys

Mean Difference		Standard Deviation	Standard Error Mean	T	DF	Sig. (2-tailed)
ENJOYMENT	2,125	10,8743	2,71857	0,782	15	0,447
ANXIETY	0	7,19259	1,79815	0	15	1

4.2 How did the Course Mediate ELT Teachers' TPACK Development?

To determine the development of ELT in-service teachers' TPACK competency in an LBD environment provided in the ICT in education course, the participants' self-reported TPACK competency was examined by analyzing data from surveys quantitatively, and document analysis was employed by coding and analyzing participants' course artifacts – specifically, course materials involving CALL lesson plans and course projects.

4.2.1 Self-reported TPACK.

The below figure illustrates the changes participants' self-reports revealing how effective the LBD learning environment in helping ELT in-service teachers construct TPACK. Thus, the average of the total scores of the ELT teachers' responses for each part of the TPACK survey before and after the treatment has been analysed. Upon the related analysis; it has been observed that no significant change in the average scores for TK,PK,PCK,and TPK has occurred. However, despite being insignificant, there has been a noteworthy increase in CK,TCK, and TPACK of the participants.

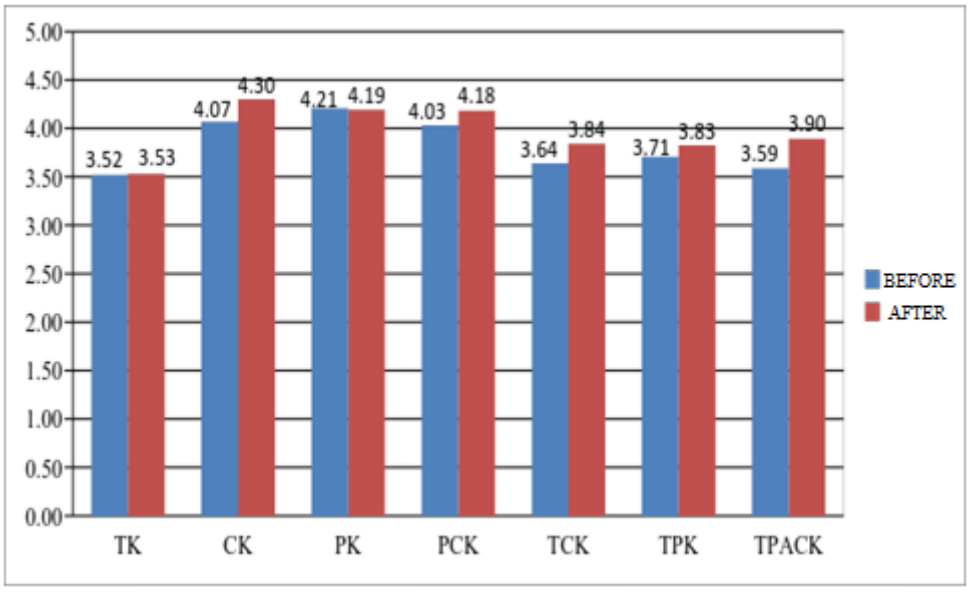

*Figure 5.*Changes in ELT in-service teachers' TPACK

Table 10

Total Scores out of the Pre- and Post-TPACK Surveys

	Mean difference	Std. Deviation	Std. Error Mean	t	df	Sig. (2-tailed)
TK	-0,067	5,775	1,491	-0,045	14	0,965
CK	-1,400	5,527	1,427	-0,981	14	0,343
PK	0,133	6,022	1,555	0,086	14	0,933
PCK	-0,600	3,680	0,950	-0,631	14	0,538
TCK	-1,000	5,555	1,434	-0,697	14	0,497
TPK	-0,600	5,316	1,373	-0,437	14	0,669
TPACK	-2,133	7,425	1,917	-1,113	14	0,285

The above table shows the total scores gained out of the pre- and post-TPACK surveys applied on the participants to measure any possible change in their TPACK, with the formation of a paired samples t-test. Accordingly, the results were identified as TK ($p=0.965>.05$); CK ($p=0.343>.05$); PK ($p=0.933>.05$); PCK ($p=0.538>.05$); TCK($p=0.497>.05$); TPK ($p=0.669>.05$); TPACK ($p=0.285>.05$) with no significant increase in TPACK observed in terms of the LBD learning environment effect on the

participants. Though providing an insight for the effectiveness of LBD environment on the participants' overall CALL experiences through a TPACK framework, the quantitative data could not provide solid evidence on why and how such an environment was effective in the participants' technology integration practices. Thus, the researcher implemented document analysis to provide a more in-depth analysis of the participants' TPACK experiences throughout the ICT course.

4.2.2 Document Analysis. While answering the second research question asking whether an LBD learning environment is effective in helping ELT teachers construct TPACK, document analysis provided a more in-depth perspective on answering the abovestated question via examination of online course discussions through the lens of TPACK codes originally created by Baran et al. (2012), and modified by Taiet al. (2014).In this sense, the course artifacts, specifically the discussions on the course discussion board and interviews were transcribed, analyzed with the key words being highlighted and and grouped under the TPACK categoriesthat were already specified codebook.

As noted, TPACK competency was regarded as a holistic, integrated, and transformative knowledge pattern (Chuang & Huang, 2012). Specifically, TPACK competency was considered as the teacher's ability to demonstrate TPACK in teaching a particular content with convenient pedagogy.Accordingly, in the present study, it could clearly be stated that TPACK codes were observed the most frequently among all codes, indicating that the participant ELT in-service teachers demonstrated their TPACK competencies and adopted them into effective CALL integration and good quality teaching.

Document analysis demonstrated a clear effect of the LBD learning environment on the TPACK construct of ELT in-service teachers during their CALL experiences when their ICT course artifacts were examined. To clarify, upon analysis of Group 1 participants' researchproject, it was observed that technology was incorporated to assess students' learning formatively, namely the CALL Competency in regards to the *702.TPACK Assess Learning*code.Similarly, participants used resources that they learned in the ICT course (*705.TPACK_Resources-content*). For instance, in their course artifact which was a CALL lesson plan prepared on teaching parts of the body, Group 3 participants created a short video including both visual

and auditory learners, combining their skills with their theoretical knowledge acquired throughout the ICT course. In addition, analysis of action research project by Group 1 showed that students were all very much engaged and on task while CALL activities were carried out in the classroom *(707.TPACK_Engagement)*.As the analysis exercised for the present study was and on teachers' actions, it was not possible to talk to the students and find out why they did what they did. However, it would have been worth investigating from students' perspectives in relation to their teachers' CALL integration (Angeli & Valanides, 2009). In the same way, participants reflected on their teaching episode by rethinking the lesson plan and how technology is used. For example, Group 1 members in their research project noted that they faced problems while assessing the students and emphasized the need for enhancing their content to effectively conduct their learners. Therefore, they addressed the interplay between technology, content and pedagogy (*710.TPACK_Reflect*). Moreover, participants were also observed to have demonstrated the CALL competencies related to *TPACK Code_712. Learner Centered* viapromoting learner-centered learning environments.To give an example, members of Group 3 noted in their CALL lesson plan that they let their students develop technology competence via playing online game and also providing them the opportunity to practice other technology skills such as opening a Word Document, editing the information and saving the file, which is, as they put it, in line with TESOL technology standarts.Table 11 illustrates some of the TPACK codes observed during the analysis of the participants' course artifacts in the present study in detail.

Table 11
TPACK Codes Observed During Document Analysis

Code	Full Code	Definition	Example(s)
702. TPACK_ Assess	702. Assessing student learning.	702. Assess Learning. Teacher uses technology and strategies to assess students' content learning in classroom	We used a writing pre-test administered in Week 1 of the program combined with weekly writing tests and a writing post-test which was conducted in week 3 to measure students' vocabulary development. (Group 1, Action Research Project , p.14) In the writing quiz which is the post test of the study, it was the same structure to measure students' vocabulary knowledge progress and it was seen that jeopardyapp game provides a positive impact on students' vocabulary learning process.(Group 1, Action Research Project , p.16)
705. TPACK_Res ources-content	Using resources (e.g., content &technology) that are collected over time to teach.	Using resources (e.g., content & technology) that are collected over time, including professional development, workshops, conference, self-learning, etc. to teach the planned lesson in classroom.	We created a short video to teach body parts vocabulary with the song Head, Shoulders, Knees and Toes. Our video includes both visual and auditory elements which appeal to learners with different styles. As stated by Hung, Young and Lin (2014), a competitive game-learning environment motivates students to make efforts to perform better. (Group 3, CALL Lesson Plan, p.1) In order to provide our learners this contextualized environment to improve their language skills by motivating and involving them actively in the exercise sessions of the lessons, we dediced to use jeopardy games since they are technological, interactive and giving immediate feedback. According to Rotter (2014), teachers have a chance to assess students' knowledge without using formal tests. Thus, the game provides immediate feedback for students. (Group 1, Action Research Project , p.10)
707. TPACK_ Engagement	Using technology to engage students in learning.	Using technology to engage (e.g. students show motivation or strong focus for the activity) students in learning about a specific content areas	During the process, the main improvement observed was that some of the students started to increase their engagement and motivation for the lesson and vocabulary learning through jeopardyapp interactive game. Moreover, the students themselves started to take part in the lesson procedure voluntarily when compared to their past attitude against the lesson procedure. (Group 1, Action Research Project , p.17
710. TPACK_ Reflect	Reflecting on teaching episode (evaluating what works and what is not working).	Reflecting on teaching episode (rethinking the lesson plan and how technology is used) and making connections to previous teaching episodes. The interplay between technology, content and pedagogy are addressed.	While using jeopardy games, we have some problems in terms of assessment and evaluation. Therefore we can change our point of view as teachers. (Group 1, Action Research Project , p.10) We need to enhance our content in the jeopardy games to help our learners effectively and conduct the task as in a way profitable as possible. (Group 1, Action Research Project , p.11)
712. TPACK_ Learner-controlconten t-learning	Allowing learners to take control of their content learning	Teacher allows students to take control on their learning in content.	Also in line with TESOL technology Standards, we let the students develop their basic technology competence by playing the online game, searching for and opening a Word Document, editing the information and saving the file. (Group 3, CALL Lesson Plan, p.1)

In sum, with the LBD model provided, participants adopted the CALL competencies they learned in the ICT course, specificially the TPACK constructs among all components of TPACK framework. This might be attributed to the fact that effective and quality teaching lies in TPACK (Koehler & Mishra, 2008), the interaction of all three knowledge domains.

4.3 How did the ELT Teachers Reflect on this Online Course Implemented in an LBD Environment?

In response to this reaerch question, it can be stated that the ELT in-service teachers generally clearly reflected LBD activities'effectiveness. In the interviews and course online discussion board, they exposed their experiences on how LBD activities facilitated their learning about technology integration into their instructional practices, affecting their perceptions on CALL teaching. Table 12 illustrates the summary of results to this research question and the following sections present and discuss these experiences transcribed by the researcher, in line with the five steps of LBD model.

Table 12

Effectiveness of an LBD model for ELT in-service teachers in an online ICT Education Course

# LBD Steps	Sample Instructional Activities	Participants' learning outcomes in Each Step
1 Understand Challenges	- Weekly readings and discussions - Familiarization with technology tools via independent research - Exposure to model activities related to course assignments	- Participants discerned the technology tools available for classroom use and improved related application skills. - Participants acquired genuine experience of technology integration. - Participants saw the opportunity to use technology in creating learner-centered activities in a language classroom.
2 Plan Design	- Discussion with group members during project planning/development - Feedback from peer and the instructor	- Formed a breeding ground for participants' idea generation for their course projects. - Communication with other project teams developed their own planning. - The complexity in planning was minimized via continuous scaffolding and feedback.

3 Design / Construct	- Design and development of the artifact - Collaboration with group members - Feedback from peers and the instructor	-Participants advanced their technological knowledge. - Participants were informed on the complex nature of technology integration for teaching.
4 Test	- Feedback from peers and instructors - Testing the artifact in either actual classroom setting or with peers	- Participants improved their understanding of student learning. - Participants had a clearer understanding of classroom management issues upon teaching their lesson. - Constructive feedback after the test was influencial in the language teachers' improving technology competencies.
5 Analyze & Explain	- Reflection on the implementation of course artifacts - Feedback from course instructor	- Participants interpreted and elaborated on their learning outcomes - Participants developed confidence as they personalized their learning experiences. - Participants became more reflective and receptive in teaching with technology.

4.3.1 LBD Step 1: Understand challenges. By exercising the weekly readings, attending the online course discussions, and getting familiarized with the technology tools via practicing independen research; the participants examined the challenges of technology integration into educational practices. Their exposure to model activities related to course assignments resulted in the following learning outcomes.

4.3.1.1 Discernment of the technology resources available for language classroom and improving of related application skills. Qualitative data obtained showed that the experience assisted the the ELT teachers in discerning what technology resources were available to them in language classroom and developing more knowledge about how to use them. As put by Ertmer (1999), insufficient technological knowledge is one of the first-order barriers in technology integration. With the LBD lens, the course facilitated the ELT teachers' understanding of how to

use technology toachieve this goal. The following statements upon the question during the interview on the course outcomes constitute an illustration of this result:

> In the first 3 weeks, it was just theoretical. There was a lot of theoretical info. And I didn't know much about it before. So as an ELT teacher, it's really beneficial to learn, to have a knowhow of the tools, to be familiar with these tools. First, we had some theoretical articles. For example, we had Task Based Learning as theoretical topic, and we read the related chapter or article, and following a discussion, we did a task with a web tool to create tasks for the teachers, called, Hot Potato. So every week, we had both theoretical chapters and practical applications. So they were really useful. (Billur, personal communication, January 22, 2015)

Moreover, while getting prepared for the course assignments, the participants developed an awareness related to challenges preparing for the construction of instructional materials as is visible with the following reflection:

> There were a lot of terminological terms/concepts that I didn't know, wasn't familiar with. So I had to first, you know, make some lab research, and sometimes literature review, so it really requires a lot of background information. That's why it was really, you know, most of the time, I devoted most of my time to searching, rather than doing the homework. So this was really difficult and challenging for me. (Billur, Personal Communication, January 22, 2015,)

4.3.1.2 Challenging experiences while trying out new tools. The participants discerned that they experienced a variety ofways to use technology for teaching and began to understand how to integrate technology forinstruction. However, they had limited opportunities in terms of observing or experiencing effective technology integration prior to the ICT course. Research suggests that insufficient knowledge and skills is one of thebarriers to classroom technology integration (Ertmer, 1999; Hew & Brush, 2007). In this sense, the participants stated that the ideas presented in the course widened their scope in considering technology language classroom use. The following statements exemplify their becoming aware of technology tools' use in the language classroom;

> To be honest, I really had a difficult time while I was preparing this mini Smartboard notebook presentation. I think it isn't a user friendly tool. Sometimes the programme didn't allow me to save the presentation. Moreover, I had to prepare the same slide four times because every time I displayed my presentation, one of the slides was missing. I think Powerpoint is a more user friendly tool to prepare interactive presentations. (Doğuş, Smartboard Discussions)

Therefore, while experiencing how to use different technology tools for instruction, the ELT teachers, could expand their repertoire in using technology in their classroom practices with various technology integration ideas, while realizing the challenges in integrating technology in their practices.

4.3.1.3 Opportunity to use technology in creating learner-centered activities. The involvement helped the participants see the opportunity to use technology in creating learner-centered activities in a language classroom. Lack of knowledge about "ways to integrate technologyinto learner-centered instruction"(An & Reigeluth, 2011, p. 59), is emphasized in literature as one of the barriers to creatingtechnology-enhanced, learner-centered classrooms. LBD model implemented during the ICT course helped theparticipants develop an understanding of how to create active learning tasks with technology. Afterpracticing the discussion in regards to the assignment on the online virtual world, Second Life, the participants realized that Second Life was morethan a virtual world that can be used to engage students in active learning activities. The following statements clearly indicate this understanding:

> We are teaching young adults and young adults are really interested in technology and the lessons which include technology. This is the first reason why we could integrate Second Life in our EFL classes. Most of the students are bored with the activities in traditional face-to-face EFL classes and SL presents a very interesting virtual learning environment to the learners where they can both entertain and learn at the same time. Students can communicate with other people through text chat, voice chat or instant messaging so SL is a very useful tool for the students to use authentic English practically. Second Life provides an interactive environment and students can interact with other

people all over the world. This interactive nature of SL will likely motivate the students to practice and learn more. SL also includes tasks, for example students will be communicating with others in different settings such as restaurants, shops, hotels and they are all examples of task-based learning. Besides, anxious students who don't have the courage to participate in the face-to-face classrooms can overcome their anxiety and participate in the virtual environment more easily and as they use the language they will learn more. (Billur, Second Life Discussions)

As noted by Zhao (2003), many technology tools are not designed as learning tools. To use technology effectively andcreatively in a classroom, teachers need to understand the instructional problem, connect theproblem with a technology tool, and repurpose the tool to solve their own problems. The above transcript indicates that the participants recognized how such a technology tool can be transferred from a virtual world to an instructional tool in course activities. The experience expanded their scope in thinking the potential of usinggeneral technology tools for learning.

4.3.2 LBD Step 2: Plan design. Planning was of significance in terms of both mini project and the course project assignment preparations. In other words, the participant ELT teachers experienced this step with the practice of discussions and course readings administered by the course instructor. In this way, they could communicate their ideas with their team and members of other project teams, therefore, could receive feedback both from their peers and course instructor.

4.3.2.1 A breeding ground for idea generationin course projects.Planning formed a breeding ground for participants' idea generation for their course projects.Below is an example for this very aspect of the plan design:

Our main point on this task was focusing game-based learning for 8th grade students. We prepared powerpoint presantation to engage them to answer multiple choice questions which was a game. When they answer each questions correct, it is okey but when they have a mistake, game directs them to our prezi presentation to get feedback about ralated topic. It is an interactive game which consisted of computer-assisted learning and autonomous learning. We also add some useful pictures for permanent and affective learning. Due to the fact that

> our topic is learning style,we integrated some videos either.Our objective is for them to able to use their previous knowledge to practise with the help of technology,TESOL and ISTE standarts. Here is the link of Prezi (if you can't see through Powerpoint) with the link to the poster included.http://prezi.com/embed/8u87od4_p-kg/. (Group 1, Glogster Poster Discussions)

Planning, especially with group members on specific course assignments provided them with the opportunity to tackle the instructionalproblem at hand and brainstorm solutions to solve the problem. The following reflection is a sound example for this benefit by the LBD environment:

> I had never used Webquest before reading this article and preparing the Webquest task for this group task. From now on, I will be using Webquest with my students. I'm teaching young adults now and it is really difficult to motivate them to do their homework enthusiastically. Paper-based assignments and tasks are perceived to be boring and monotonous by most of the learners. Webquests could offer a different, enjoyable and interesting platform for them to accomplish their tasks as it involves multimedia elements and promotes interaction. However, I think I will use Webquest to assign tasks to my pre-intermediate, intermediate or upper-intermediate students only. I think beginner level students may have some difficulty in understanding the instructions in the task without the immediate help of the teacher. (Billur, Webquest Discussions)

The above example clarifies that collaboration can facilitate the teachers' construction of the initial project ideas, as well as fostering "the development of critical thinking through discussion, clarification ofideas, and evaluation of others' ideas" (Gokhale, 1995).

4.3.2.2 Communication with other project teams developing their own planning. During the planning stage, the participants had an opportunity to discuss how they would use technology to teach the lesson with other group members. Such communication not only helped each participants clarify their ideas through presenting them to others but it also provided the participants the opportunity to

evaluate different ideas. The following lines support this effective aspect of the LBD model:

> Kiraz: While I was answering to my friend Arzu's question about hologram technology, this has come to my mind in terms of technology tools: 3D Printers.As we are tomorrow's teachers, bringing 3D printers to our classroom assuredly fuels up our creativity and helps us and our students in improving design skills. How effective would it be to get and apply this technology tool in our lessons?
>
> Derya: Hi Kiraz, Second Life can be an option for the question about 3D technologies, right?
>
> Kiraz: Hi Derya, I wasn't aware of it until you told me about it. I googled it, but secondlife.com website is unavailable. Something must be wrong. But thank you for the awareness.
>
> Derya: Hi, Kiraz, again. You are welcome. I have just checked it again and it seems ok for now: http://secondlife.com/ (Kiraz-Derya, CALL research discussions)

4.3.2.3 Complexity in planning minimized via continuous scaffolding and feedback. The complexity in planning a technology-enhanced lesson was minimized via continuous scaffolding and feedbackLacking the awareness to understand whatfactors would influence their teaching alongside having limited experience in technology use may restrict teachers' scope in planning a technology lesson (Greenhow, Dexter, & Hughes, 2008). With whole-class discussions, the instructor and the ELT teachers could work together to discuss what technology tools worked for their specific instructional contexts and the reasons to minimize such complexity of planning, thus improve awareness in such tasks. The following quotes are transcribed from the participants' discussions on ways for enhancing written and aural input in CALL. Responding to one of the participants', Billur's reflection on the topic, the group members illustrates positive feedback examples:

- Hi Billur. Thanks for the answer to this question I strongly agree with you but I would like to add that technology makes our life more isolated. Because of technology and people don't precisely interact with another like they used to in the past (Sherzad, CALL Input Discussions)

- Hello Billur, I think we all know that all these three perspectives correlate each other. You mentioned that technology cannot be isolated from the aspects of real life. Let's try to figure out what we, teachers, should do about this issue. As I can see, while students are learning through technology, how do we make sure that they avoid their lukewarm attitude about interacting with culture? Eventually they will feel isolated, so something should be done. I believe there should be limits, or some kind of interactive activities might help them to "interact" with their peers, don't you think? (Kiraz, CALL Input Discussions)

To put it another way, by continuous feedback, the teacher participants in such technology education courses can continue to address the questions the language teachers have in the planning, while they can continue to receive feedback from both their peers and instructors.

4.3.3 LBD Step 3: Design and construct. In the course projects, the ELT in-service teachers constructed technological artifacts or developed technological solutions to an instructional problem. Withthesemini projects, they designed and developed instructional materials such as PowerPoint slides or other technology tools they would use to teach, i.e. glogster poster, webquest, voice thread, and blogs . They had to design these materials outside of class independently with minimum support from peers or the instructors. Along with such mini projects, they had to prepare a course project which required thorough preparation and group work.In the interviews, the participants discussed extensively the challenge they experienced while designing and constructing these projects and practicing technology tools, factors which would influence classroom technology use and the benefits of using technology for teaching.

4.3.3.1 Constructing helped advance technological knowledge.Constructing technological artifacts helped the participants advance their technological knowledge.Though the ELT teachers were familiar with thegeneral technology tools

introduced in this course, while making technological artifacts they realized that many features of those tools were new to them. For example, during the discussion on the challenges about teaching with Second Life, Denise said:

> One of the challenges of integrating Second Life into foreign language teaching can be multitasking. Interestingly, some students can find it hard to speak and write at the same time since they need to process what they see and hear and react accordingly in the form of speaking and writing. Another problem is associated with the induction process. Teachers may take their students' computer skills for granted; however, Second Life is truly another world. Therefore, in order to make students familiar with this online world, the solution can be to provide a good induction process to both students and teachers. Another solution can be to assign tasks that students can achieve easily. The complexity of the data due to the lack of technical knowledge can be overcome in this way. (Denise, Second Life Discussion)

In addition to the above quotes which were good examples to show potential difficulties in using technology to develop instructional materials and inspired them as well on how to deal with such challenges, constructive guidance and feedback from the course instructor facilitated the participants' technology integration process. The following quotes clearly illustrate this guidance by the course instructor is the process of course project design:

> After I finished reading your action plans and Introduction parts, I emailed your feedback -except for 1 group who has not submitted them. A common weakness in all papers is related to formulating research questions, which is actually the most difficult and important skill to acquire. I know this is your first semester, so don't worry, the aim of such final projects is to improve your skills anyway :) Attached is a nice article written by my qual research professor at USF showing samples of research questions for 3 types of research methods (posted under Assignments-Action Research folder). Hope you find it helpful. Also, please use APA 6 style in your final paper- actually all course assignments written in Word. Best. (Course Instructor, Action Research Project Feedback Sample)

4.3.3.2 Understanding the complexity of technology integration whileconstructing instructional materials. The construction of instructional materials informed the participantsoncomplex nature of technology integration for teaching. When the participants constructed technological artifacts, they had to consider the issues such as pedagogical constraints and the needs of their students, even their curricular setting. Moreover, they had to support their artifacts with SLA theories. Using technology to make instructional materials thus helped the participants further develop their general technology knowledge, which, however at times turned out to be not sufficient. The following statements clearly illustrate this fact:

> Actually, the university I work at thought of integrating Second Life into language teaching. However, it did not work. There can be several reasons for this. First of all, students at the preparatory school focus on getting the necessary points to take the proficiency exam. Therefore, anything that is not a part of assessment does not attract them. Here comes another problem: How can such an online world be integrated into the assessment process? What are the tasks going to be? Does every student have the access to the necessary means? Teachers who are willing to interact with their students are more than welcome to become a member of this online world with their students. However, the exam-oriented nature of the program is a great obstacle to integrating Second Life into our language teaching. (Denise, Second Life Discussion)

According to Mishra and Koehler (2006), technological pedagogical knowledge includes "knowledge of the existence, components, and capabilities of various technologies as they are used in teaching and learning settings" (p. 1028). Hence, the above statements by the participants are evidence for the development of ELT teachers' competencies and understandings in regards to the pedagogical value of technology tools and resources according to specific instructional contexts. This may be an indicator that they began to cultivate the awareness of technological pedagogical knowledge from making technological artifacts.

4.3.4 LBD Step 4: Test. In this course, though not all of the participants could test their course artifacts in authentic classroom settings, they all were able to test their products from both a student's and teacher's standpoint; having both peer

and instructor feedback. In this way, testing had an invaluable contribution to their learning and instructional practices in terms of the following observed outcomes: improvement in the understanding of student learning, clearer understanding of classroom management issues upon actual teaching, and constructive feedback improving teachers'technology competencies, which will be detailed below.

4.3.4.1 Improvement in the understanding of student learning. Testing helped the participants improve their understanding of student learning.On one hand, some participants had the opportunity to test course artifacts on their actual teaching environments, on the other, they informally tested their products by reviewing the artifacts from both a teacher's and a student's perspective. For example, upon having practices Smartboard in his actual classroom setting, Haydan commented as follows:

> The integration of smart board into teaching can increase motivation of students. It provides many opportunities to back up teaching in terms of different skills. Unlike traditional boards, we can upload listening tracks for listening activities and instead of bringing many colorful pens, we can only use this tool. When I used this tool in the classroom, all the students suddenly looked at me and smart board after we covered the topic, I gave opportunity to write something on board and they love it. I think for them it looks like magic show and they want to try it all the time. Even for kinesthetic learners, it can be very useful to engage with it. With this tool, I can say that limit is the sky. For motivation, doing some tasks, it enhances student's engagement. Even in the break time, I can realize that they love doing something on the smart board.(Haydan, Smartboard Discussions)

4.3.4.2 Clearer understanding of classroom management issues upon actual teaching.The participants had a clearer understanding of classroom management issues upon teaching their lesson. Upon their actual classroom teaching practices in the form of first-hand experience including classroom management issues, the ELT in-service teachers acquired a more in-depth perspective of technology integration. The following reflection is a clear example of this acquisition:

> I can easily say that their first impression to smart board is like discovering America. They ignored me and directly make an eye contact with smart board.

Even what I did was the same; they had attention more than previous lessons. When I said who wanted to answer this question, I saw only 3 students raise hands but when I said who wanted to answer this question by writing, almost all the class wanted to attend. As technology is part of our lives, I can say that my students want to use in the classroom. They love trying something new, creating their own products and show them to classroom. Because of that reason, smart board is so convenient for them. (Haydan, Smartboard Discussions)

As Koehler and Mishra (2005) put it, "Design is not something that can be taught by lectures anddemonstrations. Design is a process that is best learned by experiencing it" (p. 98).Theparticipants had to experience and test their design of a lesson in its authentic setting before deciding on whether their design is suitable for achieving the instructional outcomes or not.

4.3.4.3 Constructive feedback improving teachers'technology competencies.Constructive feedback after the test was influencial in the language teachers' improving technology competencies. Following the course assignments constructive feedback with details was of more help compared togeneral feedback without details. In this sense, the feedbacks the groups received from their peers upon submitting Webquest assignment served for a sound exchange of constructive feedback among participants as illustrated in the following dialogue;

Group1: Here is our webquest link: http://zunal.com/webquest.php?w=265244. We preferred to use zunal.com because we thought it is much simpler and easier to handle. We decided to choose the "Film review" topic. We used the pictures and some useful links for the potential learners. We hope you will enjoy this as much as we did. If you have any questions, please do not hesitate to tell us.

Derya: Congratulations. I really liked the webquest. Especially the subject and the way it was given and presented. It is really engaging and I really wanted to be a part of this task. I thought that your learners are really lucky because I havent written such kind of review and it is an authentic subject that will probably encourage your students to complete the task. One more thing,

the rubric is also clearly written and guiding for learners. Good job, thanks. (Group 1 members - Derya, Webquest Discussion)

Moreover, the feedback from the Course instructor in regards to this Webquest task was significant since it supported participants' competencies in integrating technology into their instructional practices, as seen in the following statements:

The topic is definitely catchy :) You made a good plan for the task. Here are my suggestions: There are some spelling and grammar mistakes. Students need to be provided with some links for their search and questionnaire construction. How do you evaluate creativity (in your rubric)? (CourseInstructor, Webquest Discussion)

The Learning by Designprocess, as emphasized by Koehler and Mishra (2005), is iterative. In other words, design is aniterative process continually cycling back to first principles and re-thinking decisions." (Koehler& Mishra, 2005, p.98).The constructive feedback enabled the ELT in-service teachers to review their initial instructional decisions and make changes accordingly. Such experience would serve as a reference to them while solving similar or more complex problems in their future classrooms.

4.3.5 LBD Step 5: Analyze and explain. The data analysis made it clear that going through the previous steps helped participants see and reflect clearly what it entails to integrate CALL successfully and provided them with the opportunity to make connections to their own teaching practices. Specifically, with this last LBD step, it could be concluded that the ELT in-service teachers' learning outcomes were facilitated, they became more reflective and receptive of teaching with technology, and they developed confidence while personalizing their learning experiences as detailed below.

4.3.5.1 Reflection facilitating learning outcomes.Students were asked to reflect on all asssignmtnets they completed through online discussions. Qualitative content analysis revealed that thesereflections on the course activities helped the ELT teachers interpret and elaborate on their learning outcomes. As indicated by Kolodner (1997), the elaboration of their in-class learning experiences also may contribute to moresuccessful transfer in teachers' future application of the

knowledge. An example for the reflection on one of the course assignments, StoryBird task, is given below:

> Its feature which is visual makes it much more attractive for learners. Advantages: easy to use, rich visual gallery, open for interaction it is fun and collaborative. Disadvantages: it requires pro membership for grading and more features; it would be better if students can add their own drawing. It enables collaboration. So, it promotes imagination, creativity and writing skills. They can also work on the same project which let them collaborate For instance, students can work as group and they can create their own story books and by interacting with the other groups, they can boost their team work, critic, making comment and also maybe grammar skills. (Derya, StoryBird Reflection)

While reflecting, the participants recapitulated what exactly they learned, by making their in-class experiences explicit, thus, as they were describing how the instructional events unfolded in a classroom, they were able to deepen their understanding about teaching with technology, a fact which was also emphasized by Kolodner (2007).

4.3.5.2 Development of confidence while personalizing learning experiences. The results also identified that reflections facilitated the development of confidenceamong participantsas they personalized their learning experiences.Via reflection,the participants were forced to think about how to transfer what they learned into their future. The insights by Group 2 provide a sound example for this aspect of the related LBD design feature:

> The first step of the tool was painful. What we mean is registration step. Even though the registration part was easy, joining a class with a code was not familiar with the participants. Maybe this part is the hardest part of the tool. From the teacher's perspective, assigning them homework was a little bit confusing, especially if you are not familiar with this tool or the tools which are similar to this.
>
> If you are able to handle these steps and if you are still not given up :) , it is time to enjoy not only for you but also for your students. Participants like the

storybird tool since it is easy to manage, it has user-friendly features, visuals are cute, it is online and it looks very stunning when you finalize it although it is very easy to create. We guess we find it very effective. It can be used to introduce a new subject, to revise what they have already know, to arise their creativity, to do a storytelling activity and to let them write short stories. (Group 2, StoryBird Reflections)

4.3.5.3 Teachers' becoming more reflective and receptive of teaching with technology.The results indicated that *r*eflection helped the ELT in-service teachers be more reflective and receptive in teaching with technology. In the following quotes transcribed from the interview, it can clearly be seen that Dinçer was more open-minded, flexible and in a state of considering more possibilities in integrating technology into his teaching:

In this course, the thing that surprised me and in fact I really liked this, was that, I first thought I was going to use a lot of Web 2 tools, lots of applications... but no, on the contrary, there was a great focus on methodology, which helped me combine the technology and content. Technology is a good support for you as long as you focus and keep your methodology/content strong. *The theory was not only theory; it was an applicable reality in my life, my teaching.* And I integrated all of these parts in my teaching; technology, pedagogy and content. (Derya, personal communication, January 22, 2015).

4.4 Summary of Results

In regards to examine the TPACK experiences of ELT in-service teachers in CALL teaching through an LBD approach, this chapter attempted to depict the findings of the present study and provide discussions on the participants' CALL perceptions and practices in an online ICT master's course.

Overall, the results demonstrated that the ICT in Education course, following the TPACK framework through a LBD model, met participants' expectations to help them integrate CALL in certain perspectives, including using technology for teaching in general, teaching content and skills, and making effective decisions related to selection and use of technology. With a specific purpose and design, the formal teacher education in CALL could be effective in helping teachers develop their

technology competencies (Peters, 2006). These findings indicate that the five-step design of the LBD model helped them learn to integrate CALL into their teaching. What to include in the ELT teacher education courses should be another issue worth investigating. Therefore, the researcher of this study is further planning to execute a more in-depth investigation in this regards in her future academic research, including her PhD study. Essentislly, it is crucial for teacher educators to recognize what language teachers need before determining what content, technology and pedagogy needs to be included in language teacher education programs; the crucial components of technologically-competent language teachers – as emphasized by research (Egbert et al., 2002; Hughes& Scharber, 2008; Hong, 2010; Kessler, 2007; Koçoğlu, 2009; Tai &Chuang,2012). As Derya noted in the interview:

> To assist the ELT teachers in their efforts to become more competent on CALL integration, the teacher education programs need to consider the content of the courses suitable for the teachers' needs, scheduling the course contents accordingly including recent technological tools convenient for the requirements and teachers, levels of students and acknowledging curriculums. (Derya, personal communication, January 22, 2015)

Chapter 5: Implication and Conclusion

The aim of this study was to examine the TPACK experiences of 13 in-service teachers from a LBD perspective in the context of an online ICT in Education course offered in the department of English Language Teaching at a private university in Turkey in Fall 2014. The teachers' CALL integration perceptions and practices were investigated from three perspectives: the ELT teachers' Attitudes Towards Computers (TAC) before and after the online ICT course, how the course mediatedELT teachers' TPACK development, and lastly, how the ELT teachers reflected on this online ICT courseimplemented in an LBD environment. Answers to these questions were sought through qualitative and qualitative data collection, in this qualitative case study, providing convenience for conducting triangulation for an in-depth analysis as explained in Chapter 3. In this chapter, first a summary of research findings will be presented. Next, theoretical implications of the study for CALL teacher education research and practice will be discussed including recommendations for future research, which is finally followed by conclusion.

5.1 Summary of Research Findings

The summary of findings for each research question is presented in this section. In all, the participants confirmed that the ICT in-education course helped them learn about and integrate CALL through TPACK framework implemented in an LBD environment. The online ICT in Education master's course was as a unique setting which provided a profound experience for most of the participants who were taking an online course for the first time. Hence, the ELT teachers benefited from the distance education experience catered through the online course, which inevitably added to their present skills. Specifically, online discussions paved the way to the development of enhanced collaboration skills and effective class discussions within an LBD design, mediating learning. Accordingly, the findings show that the course facilitated the teachers' use of technology in teaching content and skills and in their decision making related to the selection and the integration of suitable technology tools into their actual classroom practices. In brief, the findings are demonstrated under the headings below.

5.1.1 Attitude change among participants towards computers': Not significant. Based on the first research question asking about the ELT teachers' attitudes towards computers before3 and after the ICT coursei, no statistically significant change in their anxiety was observed as well as their enjoyment levels. As found in the survey, the participants already had positive attitudes towards computers and were not anxious about the use of technology tools prior to the technology education course. It should also be noted that despite the TAC results, the participants revealed the changes in their perceptions as well as practices related with technology tools in the course discussions, as well as during the interviews.

5.1.2 LBD environment facilitated their TPACK construct. As for the second research question asking how the online ICT course mediated the ELT teachers' TPACK development, the data collection tools were pre-/post-TPACK surveys which were analyzed quantitatively and course artifacts of the participants including CALL Lesson Plans and Action Research Projects which were coded and analyzed qualitatively by implementing document analysis via the use of TPACK codes originally created by Baran et al. (2012), modified by Tai et al (2014). Though no statistically significant change in the average scores for TK, PK, PCK and TPK was found, a noteworthy increase in the the ELT in-service teachers' CK, TCK and TPACK constructs was observed via the application of pre- and post-study TPACK surveys. Moreover, upon the document analysis which provided a more in-depth examination of the participants' TPACK-related perceptions and practices via the frequent observation of TPACK codes, it was observed that teachers demonstratedcompetencies required for an effective CALL teaching. Specifically, a clear effect of the LBD learning environment on the ELT teachers' TPACK construct was found when their course artifacts were examined with the presence of the following TPACK codes found during the document analysis: 702. TPACK_Assess: Assessing student learning; 705. TPACK_Reseources_content: Using resources (e.g., content &technology) that are collected over time to teach; 707. TPACK_Engagement: Using technology to engage students in learning; 710. TPACK_Reflect: Reflecting on teaching episode (evaluating what works and what is not working); 712. TPACK_Learner-controlled-learning: Allowing learners to take control of their content learning.

5.1.3 Positive perception reflecting LBD effectiveness. The participants generally felt that activities which were designed according to the LBD approach, were beneficial. In the interviews and course discussion board, they expressed in greater details how course activities assisted in their learning about teaching with technology. Essentially, it was clear that they had developed an *awareness of the complexity and challenges in technology integration for their instructional practices*, which can also be perceived as another evidence for their TPACK development. Moreover, besides having extended their technology knowledge in the course, the participants also developed an *awareness of the opportunity to internalize their learning experiencesduring the planning & design* – a fact which facilitated their interpretation and elaboration on their learning outcomes. Additionally, *constructive feedback both from peers and the instructor improved their learningupon testing their artifacts*, consequently leading them to *be more reflective and open-minded* in regards to their future CALL teaching practices.

5.2 Theoretical and Pedagogical Implications

Findings of the present study confirm the results of earlier studies in regards to the mediating role of CALL training via technology education programs, focusing on learning by doing, leading to changes in teachers' perceptions and instructional practices(i.e. Chao, 2006; Egbert, 2006; McNeil, 2013; Tai, 2013) emphasizing the scarcity of research on such training especially in online learning environments (i.e. Arnold, Ducate, & Lomicka, 2005).Specifically, the current study thereof offers teacher educators a unique opportunityto acknowledge researching and evaluating teacher professional development programs through a variety of perspectives. The findings provide insightful evidence on the fact that teachers' CALL experience, knowledge and competence is not fine-tuned solely by teachers' own perceptions. What is furthermore to be considered is that, there is an additional lens of evidence required including student/teacher learning experiences and learning outcomes out of such valuable teacher education courses including online course artifacts as additional data source.In this respect, the findings might contribute further to a more in-depth understanding of the impact of a LBD environment following TPACK framework as a theoretical basis which provided multiple pathways unique to the case explored in the study. Such an understanding would help teachers develop

CALL competencies, adopt such competencies in their actual classroom practices, and discern what an effective CALL integration requires. Accordingly, the implications of findings in relation to CALL teacher education research and practice are discussed in the following sections accompanied by recommendations for future research.

5.3 Recommendations for Further Research

Recommendations for future studies will be described in the following subsections including further awareness on LBD and TPACK, the need for modification on assessing TPACK and TAC, and Informing design of CALL teacher education programs.

5.3.1 Further awareness on LBD and TPACK. On the theoretical level,considering learning in LBD as being, "a natural consequence of applying knowledge to new situations,noticing and analyzing the results, and inserting the experience into memory" (Kolodner, 1997, p. 60), this study extended current theoretical awareness on the LBD model, and enhanced further understanding of ELT in-service teachers' TPACK development. When articulating what they have learned in LBD, ELT teachers also had to encounter the complexity of technology use in authenticteaching contexts, thus cultivating a deeper understanding of the complex and potent relationship of content, pedagogy, and technology in TPACK. Such an awareness and understanding is a result of the learning-by doing approach which is supported by the litetature requiring the integration of CALL through doing CALL (Chapelle, 2003; Kereluik et al, 2012; Tai & Chuanh, 2012; Hervey & Watson, 2013). Further research could be conducted in a variety of settings especially within the Turkish context considering the scarcity of related studies encompassing theoretical basis accompanied by related practices.

5.3.2 The need for modifications on assessing TPACK and TAC. Recognition of TPACK as a unique body of knowledge requires assessing this construct taking into account the issue of how technology and its affordances; pedagogy, content, stakeholders, and context are synthesized. Accordingly, as Harris et al. (2010) put it, "external assessment of those practices and their artifacts, triangulated with the contents of teachers' self reports, should help us to better

understand the nature of their TPACK by inference" (p.324). Hence, this study not only indicates the continuous theoretical development needed to strengthen and clarify TPACK construct and its sub-domains and but also calls for modification of measurements related to it including the participants' TAC change as another area of attention for future research. With modified future TPACK and TAC surveys which are customized for the specific outcomes of such teacher education programs with respect to the needs of participants, more meaningful data will be revealed in such research, paving the way for more enhanced and thorough evaluation TPACK competencies out of these programs.

5.3.3 Informing design of CALL teacher education programs. In addition to provide a deeper perspective for examining TPACK developments of teachers in their CALL teaching perceptions and practices within a LBD setting, on the practical level, this study attempts to explore how TPACK and LBD can be implemented as the basis of technology integration courses for in-service ELT teachers. This study can help practitioners on creating an LBD environment in technology preparation programs with an attempt to provide a deeper cognizance of how such an environment assists in ELT teachers' TPACK development and the circumstances affecting the this model's efficiency. The lessons learned upon this study can assist the teacher educators in their pursuit of developing more effective teacher education programs for language teachers to develop TPACK. Moreover, the setting of the study being an ICT in Education course delivered online makes it a unique context considering the scarcity of such online teacher education programs – a fact calling for further research aiming at examining the application of LBD model in such settings in this respect.

From a pedagogical perspective, considering the delivery of ICT in Education course as a fully online setting for the present study where the participants had to use technology regularly to receive instruction, communicate, cooperate and complete the tasksand projects, blending of face-to-face instruction elements into such courses when necessary might be an option to be considered in order to provide additional motivational support for the learners in the future studies.

5.4 Conclusion

This study aimed at evaluating the TPACK experiences of a group of ELT teachers in an LBD environment with the foci on their CALL perceptions and practices as a result of participating in an online ICT master's course from three different perspectives; the participants' attitudes towards computersbefore and after the ICT course, how the course mediated their TPACK construct, and how the ELT teachers reflected on this ICT course implemented in an LBD setting. Through multiple data collection sources including pre-/post-study surveys, document analyses and interviews, the findings of the study indicated that the LBD design facilitated the ELT in-service teachers' TPACK development, helping them integrate CALL competencies, allowing them to adopt these competencies into their classroom practices. Specifically, despite the few limitations, the study offers teacher educators to acknowledge researching, developing, and evaluating teacher training programs through multiple perspectives.

It is also crucial to consider that fine-tuning TPACK experience in CALL requires aligning theory and practice, or in other words, calls for thorough design andplanning accompanied by consequent research and practice within CALL teacher education programs. Essentially, as indicated by the literature, the answer to the quest of ''how teachers' understanding of technologies and pedagogicalcontent knowledge interact with one another to produce effective teaching with technology"(Koehler & Mishra, 2008, p. 12), lies in the fact that "teachers need opportunities to learn with the technology by being exposed to authentic, learner-centered activities that allow them to construct their own understanding of the learning outcomes" (Pope et al., 2008, p.579).In this sense, the current study advocates the implementation of LBD in teachers' integrating CALL into teaching through doing CALL within the TPACK framework, yet, calling for more amount of empirical studies in this area. As a whole, the current study not only adds to the limited body of research in regards to facilitating and evaluating the ELT in-service teachers' CALL perceptions and practices within TPACK framework in an LBD setting, it also informs both researchers and practitioners in Turkey and around the world, carrying a belief for a more promising future in such teacher education interventions.

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APPENDICES

A. ADAPTED TPACK PRE-/POST-SURVEY

Instruction

Technology is a broad concept that can mean a lot of different things. For the purpose of this questionnaire, technology is referring to digital technology/technologies. That is, the digital tools we use such as computers, laptops, iPods, handhelds, interactive whiteboards, software programs, etc. Please fill in the demographic information, and then read carefully each of the statements and then indicate your answers based on the five alternative options below:

SD = Strongly Disagree

D = Disagree

N = Neutral

A = Agree

SA = Strongly Agree

Give a checkmark (√) on the chosen answer. There are no wrong answers in this questionnaire as long as you answer it based on your feeling and opinion. Your privacy is kept.

Demography information

Name : ……..
Age : ……
Gender : male female
Educational background: Bachelor Master
Other……
Teaching experience :…….year/s

Please, indicate (□) which technology is available to you at home and at the language centre and which technology is in use by yourself. If there are other technologies that you use, please mention them in the column provided.

Technology	Available at home	I use this at home	Available at the Language Centre	I use this at the Language Centre
Internet connection				
Desktop computer				
Laptop				
Webcam				
Printer				
Scanner				
iPad				
iPod Touch				
MP3 player				
Digital camera (picture)				
Mobile phone				
eBook reader				
Tape recorder				
Radio				
……..				
……				

Items	Strongly Disagree	Disagree	Neither Agree or Disagree	Agree	Strongly Agree
TK (Technology Knowledge)					
1. I know how to solve my own technological problems.					
2.I can learn technology easily.					
3.I keep up with important technologies.					
4.I frequently play around technology.					
5.I know about a lot of different technologies.					
6.I have the technical skills I need to use technology.					
CK (Content Knowledge)					
7.I have sufficient knowledge about listening.					
8.I have sufficient knowledge about speaking.					
9.I have sufficient knowledge about reading.					
10.I have sufficient knowledge about writing.					
11.I can use a literary way of thinking.					
12.I have various ways and strategies of developing my English competency.					
PK (Pedagogical Knowledge)					
13.I know how to assess student language performance in a classroom.					
14.I can adapt my teaching based –upon what students currently understand or do not understand.					
15.I can adapt my teaching style to different learners.					
16. I can assess student learning in multiple ways.					
17.I can use a wide range of teaching approaches in a classroom setting.					
18. I am familiar with common student understandings and misconceptions.					
19. I know how to organize and maintain classroom management.					
PCK (Pedagogical Content Knowledge)					
20.I can select effective teaching strategies to guide student thinking and learning for listening skill.					
21.I can select effective teaching strategies to guide student thinking and learning for speaking skill.					
22.I can select effective teaching strategies to guide student thinking and learning for reading skill.					
23.I can select effective teaching strategies to guide student thinking and learning for writing skill.					

TCK (Technological Content Knowledge)					
24.I know about technologies that I can use for understanding and learning listening skill.					
25.I know about technologies that I can use for understanding and learning speaking skill.					
26.I know about technologies that I can use for understanding and learning reading skill.					
27.I know about technologies that I can use for understanding and learning writing skill.					
28.I know about technologies that I can use to teach about the differences between the cultures.					
TPK (Technological Pedagogical Knowledge)					
29.I can choose technologies that enhance the teaching approaches/strategies for a lesson.					
30.I can choose technologies that enhance students' learning for a lesson.					
31.I can design, using technology, relevant learning experiences to promote student learning.					
32.I think critically about how to use technology in my classroom.					
33.I can adapt the use of the technologies that I am learning about to different teaching activities.					
TPACK (Technology Pedagogy and Content Knowledge)					
34.I can teach lessons that appropriately combine listening, technologies and teaching approaches.					
35.I can teach lessons that appropriately combine speaking, technologies and teaching approaches.					
36.I can teach lessons that appropriately combine reading, technologies and teaching approaches.					
37.I can teach lessons that appropriately combine writing, technologies and teaching approaches.					
38.I can use technology to communicate relevant information to students and peers.					
39.I can facilitate intercultural understanding by using technology to engage students with different cultures					
40.I can select technologies to use in my classroom that enhance what I teach, how I teach and what students learn					

B. ADAPTED TAC PRE-/POST-SURVEY

Instruction

Please fill in the demographic information, and then read carefully each of the statements and then indicate your answers based on the five alternative options below:

SD = Strongly Disagree

D = Disagree

N = Neutral

A = Agree

SA = Strongly Agree

Give a checkmark (√) on the chosen answer. There are no wrong answers in this questionnaire as long as you answer it based on your feeling and opinion. Your privacy is kept.

Demography information

Name: ……..

Age: ……

Gender: □ male □ female

Educational background: □ Bachelor □ Master □

Other……

Teaching experience:…….year/s

No.	Statement	SD	D	N	A	SA
1.	I think that working with computers would be enjoyable and stimulating.					
2.	I want to learn a lot about computers.					
3.	The challenge of learning about computers is exciting.					
4.	Learning about computers is boring to me.					
5.	I like learning on a computer.					
6.	I enjoy lessons on the computer.					
7.	I can learn many things when I use a computer.					
8.	I believe that it is very important for me to learn how to use a computer.					
9.	A job using computers would be very interesting.					
10.	The people who give me the best ideas for improving teaching also tend to know about computers.					
11.	I concentrate on a computer when I use one.					
12.	I believe that I am a better teacher with technology.					
13.	I get sinking feeling when I think of trying to use a computer.					
14.	Working with a computer makes me feel tense and uncomfortable.					
15.	Working with a computer makes me nervous.					
16.	Computers intimidate me.					
17.	Using a computer is very frustrating.					
18.	I feel comfortable working with a computer.					
19.	Computers are difficult to use.					
20.	I think that computers are very easy to use.					
21.	I have a lot of self-confidence when it comes to working with computers.					
22.	Computers are hard to figure out how to use.					

C. INTERVIEW QUESTIONS

1. How did you find the ICT course?

2. What are the strong points about the ICT course?

3. What are the weak points about the ICT course?

4. What did you learn from course (e.g., knowledge, skills, attitude, and beliefs)?

5. Which aspect/phase of the course is the most beneficial for your understanding and ability

of designing technology-rich lessons? Why?

6. What would you like to suggest to improving the ICT course?

7. What difficulties did you find in designing lessons based on TPACK framework?

In what way do they influence?

8. How do you solve such difficulties?

D. ADAPTED TPACK CODES

Baran et al. (2012) TPACK Codes modified by Tai (2014)

TPACK	
700. TPACK_Use	
701. TPACK_ Match Affordance	
702. TPACK_Assess	
703. TPACK_Prepare	
705. TPACK_Resources_content	
706.TPACK_Connect_others_learn_content	
707. TPACK_Engage	
708. TPACK_Teacher-Needs	
709.TPACK_Affordance-Teaching	
710. TPACK_Reflect	
711. TPACK_Teacher collaboration*	
712. TPACK_Learner control-Content learning*	
713. TPACK_Content learning-beyond classroom*	

TPK	
600. TPK_Prepare_Materials	
601. TPK_Selection_Pedagogy	
602.TPK_Coordinating_ Tech	
603. TPK_Share_Pedagogy_ Role	
604. TPK_Troubleshooting_Managing	
606. TPK_Extend_CR	
607. TPK_Engagement	

608. TPK_Demo_Tech	
610. TPK_Reflect*	

TCK	
400. TCK_Create_Alternative	
401. TCK_Match_Affordance	
402 TCK_Use technology-to teach-content*	

PCK	
500. PCK_Teaching_Strategy	
501. PCK_Assess_Learning	
502. PCK_Elicit_Knowledge	
504. PCK_Provide_Examples	

TK	
100. TK	
101. TK_Use	
104. TK_Affordance	
105. TK_Setup	
106. TK_Troubleshoot	
110. TK_Location	
115. TK_Support	
117. TK_Transfer	

CK	
300. CK_Demo-Content Within Content	
303.CK_Interdisciplinary-Connections	
304. CK_Accurate-Response	

PK	
200. PK_Manage	
201. PK_Strategies	
202. PK_Facilitate_Student-Centered	

* New TPACK codes by Tai et al. (2014)

E. CURRICULUM VITAE

PERSONAL INFORMATION

Surname, Name: Alp, Pınar

Nationality: Turkish (TC)

Date and Place of Birth: 03 November 1975, Zonguldak

email: pinar.alp@bahcesehir.edu.tr

EDUCATION

Degree	Institution	Year of Graduation
BS	Hacettepe University	1997

WORK EXPERIENCE

Year	Place	Enrollment
2012 - 2015	Bahçesehir University	Instructor
2001 - 2012	Ministry of Education	ELT Teacher
2000 – 2001	Sistem Publishing	English Translator
1999 – 2000	Image Public Relations	English Translator

FOREIGN LANGUAGES

Advanced English

Intermediate French, Italian, German

HOBBIES

Spiritual Readings, Swimming, Movies

1. Giriş

Bilişim teknolojisindeki gelişmeler eğitim programlarında kalıcı bir değişim ve dönüşümü tetikleyerek eğitim araştırma ve uygulamala alanlarında kapsamlı ve derin etkiye neden olmuş, bu alanlarda reforma gidilmesini kaçınılmaz kılmıştır. Sözkonusu rerformlarla yalnızca öğretmenlerin alanlarında uzmanlaşacağına değil, aynı zamanda öğrencilerin de çağımızın gereklerine uygun olarak özgün öğrenim olanaklarının artacağına inanılmaktadır. Bu anlamda İngiliz Dili eğitimi alanında da bilgi ve iletişim teknolojilerinin önemine dair farkındalık artmış, özellikle bigisayar destekli dil öğreniminde öğretmenlerin, dil sınıflarında teknolojiyi kullanma insiyatifi alan, hangi teknolojinin neden ve nasıl kulanılacağına karar verecek olan uzmanlar olarak eğitimdeki hayati rolü büyük önem kazanmıştır. Bu doğrultuda, billgisayar destekli dil eğitim ve öğretimi hevesli öğretmenlerden oluşan küçük gruplardan, giderek büyüyen uluslarası profesyonel oragnizasyonlara kadar geniş bir yelpazede giderek artan biçimde ses bulmaya başlamış, bu alanda uzman öğretmenlere ihtiyaç ve talep de parallel şekilde artmaya başlamıştır.

Dil öğretiminde teknolojik yeterlilik ve donanıma sahip öğretmenlerin yetiştirilmesinde çeşitli öğretmen eğitim programları ve teknoloji atölyelerinin rolü büyük önem arz etmektedir. Ne var ki, sözkonusu programlar çeşitli nedenlerden ötürü eleştiri almaktadır

Özellikle, bu programların ne içermesi ve içeriklerinin öğretmenlerin teknoloji entegrasyon becerilerini nasıl etkilediği, üzerinde durulması gereken meselelerdir. Ayrıca teknoloji kullanım becerilerinin edinilmesiyle, teknolojinin eğitime entegre edilmesinin önündeki ilk ve harici engel kalksa da, öğretmenler bu doğrultuda sözü edilen becerileri anlamlı biçimde günlük rutinlerine katma yönündeki algı ve inançlarına dayalı ikinci ve dahili engelin aşılması konusunda zorluklar yaşamaktadır. Dahası, yukarıda bahsedilen teknoloji eğitim programları, yeterli teorik temelden yoksun oldukları yönünde de eleştiri almaktadırlar. Teorik altyapıyla desteklenen programların da öğretmenlerin bu teoriyi pratikle harmanlayacak bir uygulama ortamı sağlama konusunda yetersiz olduğu anlaşılmaktadır. Bu nedenle, bu araştırma, öğretmenlerinin bilgisayar destekli yabancı dil öğretiminde teknolojiyi

pedagojik ve içerik bilgileriyle harmanlayarak, teoriyi pratikle birleştirmelerinde; tasarım yoluyla, yaparak öğrenme deneyimlerinin, onların yabancı dil öğretim algı ve uygulamaları üzerindeki etkilerini sorgulamayı amaçlamaktadır.

2. **Aan Yazın Tarama**

Bilgisayar destekli dil öğretim programlarının, teknoloji entegrasyonunda öğretmenlerin güven ve pozitif tutumları üzerinde olduğu kadar (Hegelheimer, 2006; Hoven, 2007; Meskil et al., 2006; Sun, 2010), öğretim uygulamaların üzerinde de (McNeil, 2013; van Olphen, 2008) iyileştirici etkisi olduğu saptanmıştır.

Ancak yapılan araştırmalarda, öğretmenlerin teknoloji entegrasyonlarına dair söylemleri ile gerçekleştirdikleri uygulamaların eşleşmediği gözlemlenmiştir (Wong & Benson, 2006). Bu nedenle, sözkonusu teknoloji eğitim programlardaki deneyimlerine yönelik araştırmalarda öğretmenlerin öz raporlamaya dayalı anket ve mülakat gibi verilerini desteklemek amacıyla, performansa dayalı very araçlarının kullanımın ihtiyaç duyulmuştur. Bu ihtiyaca binaen öğretmenlerin bu karmaşık teknoloji entegrasyon sürecinin derinlemesine gözlemlenebileceği bir kuramsal çerçeve olan Teknolojik Pedagojik Aloan Bilgisi (TPAB) kuramsal çerçevesi ve bu teorik çerçevenin pratiğe geçirilmesinde önemli rolü olması dolayısıyla; Tasarım Yoluyla Öğrenme ortamına dair aşağıda belirtilen yazın dahilinde de tarama yapılmıştır.

2.1 Teknolojik Pedagojik Alan Bilgisi (TPAB)

Mishra ve Koehler (2006) tarafından önerilen bu kuramsal çerçeve ile amaçlanan, öğretmenlerin etkin teknoloji entegrasyon bilgilerinin anlaşılması ve etraflıca değerlendirilebilmesidir.

Bu kuramın temeli, Shulman'ın (1986, 1987) Pedagojik Alan Bilgisi kavramına dayanmakta olup, söz konusu kavramın (TPAB) teknoloji unsurunun da eklenmesiyle pedagoji ve içerik kavramlarındann bağımsız değil, onlarla birlikte bütünsel olarak değerlendirilmesi gereğini gözler önüne sermiştir (Thompson & Mishra, 2007).

Burada bağlamın teknoloji entegrasyonundaki önemi, farklı ortamlara göre farklı TPAB modellerinin oluşturulması gereği de araştırmacılarca vurgulanmaktadır

.

(Cox, 2008; Mishra & Koehler, 2006). Bilgisayar destekli yabancı dil öğrenimi bağlamında da teknoloji dil öğretimine entegrasyonu için çeşitli kuramsal çerçeveler ortaya konulmuş olup (Hampel & Stickler, 2005; Hubbard & Levy, 2006; van Olphen, 2008) bu çerçevelerden van Olphen'in sunmuş olduğu yaklaşım, bu çalışmada İngilizce öğretmenlerinin teknoloji entegrasyon deneyimlerinin analiz edilmesinde bağlamsal bir temel ve uygulama anlamında da bir perspektif sağlamıştır.

Öğretmenlerin TPAB gelişiminin anlaşılması ve değerlendirilmesine yönelik çalışmalarda TPAB'nin alt alanlarının da ölçüldüğü çeşitli anketler oluşturulmuştur (Koehler & Mishra, 2005a; Archambault & Crippen, 2009; Schmidt et al. 2009a, 2009b). Bu çalışmada Schmidt ve arkadaşlarının (2009) genişletilmiş araştırmalar sonucu oluşturduğu TPAB anketi adapte edilerek kullanılmış, olup, bir başka değerlendirme aracı olarak Tai ve arkadaşlarınca (2014) adapte edilmiş olan bir TPACK Kod çizelgesinden de nicel verilerin değerlendirilmesinde faydalanılmıştır.

2.2. Tasarım yoluyla öğrenme

Teknoloji, pedagoji ve içerik arasındaki karmaşık etkileşimin gözlemlenip değerlendirilmesi anlamında teknoloji eğitim programlarına katılan öğretmenlerin bu etkileşimi derinlemesine ortaya koyacak teori ile pratiğin içiçe geçtiği, bilgi ve uygulama arasında bağlantılar yapabildikleri tasarım temelli bir yaklaşım ihtiyacı araştırmacılarca ortaya konmuştur (Koehler & Mishra, 2008; Lawless & Pellegrino, 2007).

Tasarım yoluyla öğrenme teorisi ilk olarak Kolodner ve arkadaşlarınca (2003) önerilmiş olup, bir gerçek hayatta kullanıma yönelik materyal tasarımı yoluyla öğrenmenin öğrenciler üzerinde bir konu yahut kavramı öğrenme ve anlamaya yönelik önemli etkisi olduğu araştırmacılarca ortaya konmuştur (Han & Bhattacharya, 2001; Koehler & Mishra, 2005a).

Tasarım yoluyla öğrenme ortamının öğrenmeye etkilerini araştırmaya yönelik çalışmaların azlığı dolayısıyla (Fessakis & Dimitracopoulou, 2008; Kolodner et al., 2003; Lu et al. 2011) bu çalışmada, Kolodner ve arkadaşlarının (2003) oluşturduğu

tasarım yoluyla öğrenme modelinin Lu ve arkadaşlarınca (2011) modifiye bir versiyonu İngiliz dili eğitimi alanına uygun olacak şekilde adapte edilerek kullanılması öngörülmüştür.

3. Yöntem

Bu çalışmanın amacı, 2014 güz döneminde Türkiye'de bir özel üniversitede verilen "Eğitimde Bilgi ve İletişim Teknolojileri" (EBİT) çevrimiçi yüksek lisans dersine katılan 13 İngilizce öğretmeninin öğretim algı ve uygulamalarındaki teknolojik pedagojik alan bilgisi (TPAB) gelişimlerini araştırmaktır. Bu durum çalışmasında, öğrencilerin TPAB gelişimleri, tasarım yoluyla öğrenme (LBD) modülü ile izlenmiş, bu çerçevede öğretmenlerinin bilgisayara yönelik tutumlarının, EBİT dersinin katılımcıların TPAB gelişimlerine katkısının, ve katılımcıların tasarım yoluyla öğrenme modülü çerçevesinde EBİT dersine yönelik görüşlerinin incelenmesi amaçlanmıştır. Tez araştırma soruları:

1. Öğretmenlerin EBİT dersi ve öncesi bilgisayar ve teknoloji kullanımına dair tutumları nasıldı?

2. EBİT dersi, katılımcı İngilizce öğretmenlerinin TPAB gelişiminin gelişimine nasıl katkı sağladı?

3. Öğretmenlerin tasarım yoluyla öğrenme ortamında gerçekleştirilen bu derse dair göüşleri nasıldı?

3.1 Evren, Örneklem ve Çalışma Grubu

Bu çalışmaya sözkonusu özel üniversitenin EBİT dersini İstanbul ve İzmir'den alan 30 öğrenciden 13'ü gönüllü olarak katılmıştır. Çalışmanın deseni nitel durum çalışması metodolojisi kullanılarak oluşturulmuş olup veri kaynakları; mülakat soruları, tasarım yoluyla öğrenme materyalleri ve çevrimiçi ders tartışma panosunun doküman analizi için kullanılan nitel verilerin yanısıra, bilgisayar tutum anketi ile TPAB anketinden oluşan nicel veriler de araştırma bulgularını desteklemek adına kullanılmıştır.

3.2 Verilerin Toplanması ve Analizi

Bu çalışmada her bir araştırma sorusunun farklı açılardan analizinie imkan veren üçgenleme (Triangulation) yöntemi kullanılmıştır. Bu metod, "Bulguların yorumlanma kabiliyetini arttırmak için araştırma tasarımını daha güçlü kılan iki ya da daha fazla yönü işe koşmaktır " (Campbell ve Fiske, 1959; Denzin, 1970; Polit ve Hungler, 1995).

Araştırmanın birincisi sorusu için araştırma öncesi ve sonrasında uygulanan ve 22 kalemden oluşan bilgisayar tutum anketiyle nicel araştırma metodu kullanılmıştır. Bu anket Christensen ve Knezek'in anketinin (1998) adaptasyonudur. 13 katılımcının bilgisayar tutumlarının analizi için eşleştirilmiş iki grup arasındaki farkların testi (Paired-Samples "t" testi) tekniği kullanılmıştır.

Araştırmanın ikinci sorusu için hem nicel hem de nitel veri anlizi yapılmıştır. Nicel veri analizi için araştırma öncesi ve sonrası katılımcılara, Schmidt ve arkadaşlarınca (2009) hazırlanan TPAB anketinin adapte edilmiş versiyonu yukarıda belirtilen diğer anketle aynı test tekniği kullanılarak uygulanmıştır. Bu şekilde İngilizce öğretmeni katılımcıların EBİT dersi öncesi ve sonrası TPAB algıları ölçülmüştür. İkinci soru için ayrıca nitel içerik analiz tekniği kullanılarak EBİT ders doküman analizleri yapılmıştır. Bu analiz için Baran ve arkadaşlarınca (2012) hazırlanan TPAB kod çizelgesinin Tai ve arkadaşlarınca (2014) modifiye edilmiş versiyonu kullanılmıştır.

Araştırmanın üçüncü sorusu için nitel veriler olarak çevrimici ders tartışma pano ve mülakat içerikleri ve kullanılmşıtır. Bu sayede İngilizce öğretmenlerinin EBİT dersindeki deneyimlerine yönelik görüş ve fikirleri nitel veri analiz yöntemiyle incelenmiştir. Bu analiz için Lu ve arkadaşları (2011) tarafından adapte edilmiş tasarım yoluyla öğrenim modeli kullanılmıştır.

3.3 Sınırlama ve Sınırlandırmalar

İlk olarak, "Eğitimde Bilgi ve İletişim Teknolojileri" (EBİT) çevrimiçi yüksek lisans dersine katılan 13 İngilizce öğretmeninin öğretim algı ve uygulamalarındaki teknolojik pedagojik alan bilgisi (TPAB) gelişimlerini araştıran bu çalışma, katılımcı

sayısının kısıtlılığı nedeniyle sonuçlrın farklı eğitim ortamlarında genelleştirilmesini sınırlandırmaktadır.

Ayrıca katılımcıların EBİT dersi öncesi ve sonrası öğretim uygulamaları gözlemlenmemiştir. Öğretmenlerin çalıştıkları farklı evrenlerdeki bilgisayar destekli dil öğretim uygulamalarının gözlemlenmesi, Türkiye'de söz konusu alandaki öğretmen eğitim çalışmalarına yönelik daha derin ve kapsamlı bir anlayış oluşumunu sağlayacaktır.

4.Bulgular

Araştırmanın ilk sorusuna yönelik olarak; İngilizce öğretmenlerinin bilgisayar tutumlarında, yapılan anket çalışmalarının karşılaştırılması sonucunda öğretmenlerin çalışma öncesi ve sonrası arasında tutumlarında istatistiksel anlamda belirgin bir fark gözlenmemiştir. Anketin ortaya koyduğu üzere, öğretmenler çevrimiçi EBİT dersi öncesinde de bilgisayar kullanımına dair pozitif tutuma sahip olup teknoloji araçlarının kullanımına yönelik bir anksiyete taşımamaktadırlar. Ancak şu nokta gözönünde bulundurulmalıdır ki, anket sonuçlarında anlamlı bulgulara ratlanmamış olsa da katılımcılar gerek çevrimiçi ders tartışma panosundaki yorumlarında gerekse mülakatlarda teknoloji araçlarının kullanımına yönelik değişen algılarını ortaya koymuşlardır.

Araştırmanın ikinci sorusu olan, EBİT dersininin İngilizce öğretmenlerin TPAB gelişimine katkısına yönelik olarak; TPAB anketlerinin analizi sonucunda istatistiksel olarak katılımcıların içerik bilgisi, teknolojik içerik bilgisi ve TPAB ölçümlerinde kaydadeğer artış gözlemlenmiş olup, doküman analizi ile bu inceleme derinleştirilerek öğretmenlerde TPAB kodlarının uygulanması sonucunda etkin bir bilgisayar destekli dil öğretimine yönelik algı, uygulama ve becerilerini geliştirdikleri saptanmıştır. Özellikle, tasarım yoluyla öğrenme ortamının, belirgin etkisi olarak; incelenen EBİT ders dokümanlarında TPAB kod çizelgesindeki değerlendirme, kaynak kullanma, angaje olma, öz değerlendirme, ve öğrenci kontrollü öğrenme becerilerinde gelişim örnekleri gözlemlenmiştir. Şöyle ki, katılımcıların teknoloji entegrasyonunun karmaşık yapısına ve zorluklarına dair farkındalık oluşması dahi TPAB gelişimleri açısından önemli bir tesbittir.olarak kabul edillebilir.

Araştıurmanın üçüncü sorusunda, İngilizce öğretmenlerinin Tasarım yoluyla öğrenim ortamında gerçekleştirilen EBİT dersiyle ilgili a Tasarım yoluyla öğrenim ortamında gerçekleştirilen aktivitelere dair görüşlerinin araştırılması amaçlanmıştır. Çevrimiçi EBİT dersi tartışma panosundaki tartışmalar, mülakatlar ve dersi veren öğretim üyesinin araştırmacıya sağladığı geribildirim numuneleri de incelendiğinde pozitif bulgulara rastlanmıştır.Şöyle ki, ders süresince aslında karmaşık bir yapısı olan: teknolojinin eğitime entegrasyonuna dair bilgileri gelişmekle kalmayıp, bu bilgileri içselleştirerek, materyal hazırlama sürecinin, tasarım yoluyla öğrenme modelinde belirtilen tüm aşamalarını içselleştirerek deneyimlemişlerdir. Bunun akabinde oluşturdukları materyaller üzerinde tartışarak öğrenme edimlerini em öğretmen hem öğrenci perspektifinden değerlendirme fırsatı bulmuşlardır. Böylelikle gelecekteki bilgisayar destekli öğrenim/öğetim uygulamaları için daha açık fikirli olmalarına imkan veren bir bakış açısı geliştirmişlerdir.

5. Tartışma ve Sonuçlar

Elde edilen bulgulara göre tasarım yoluyla öğrenme ortamı, çalışmaya katılan İngilizce öğretmenlerinin TPAB gelişimini kolaylaştırmış, bilgisayar temelli dil öğretmi becerilerini geliştirmiş, bu becerileri öğretim etkinlik ve uygulamalarına aktarmalarını sağlamıştır. Bu bulgular, Bilgisayar destekli dil öğrenimine yönelik teknoloji eğitim programlarının bu anlamdaki etkin rolünü ortaya koyan önceki çalışmaları (Chao, 2006; Egbert, 2006; McNeil, 2013, Tai, 2013) desteklemektedir.

Bu çalışma öğretmen mesleki gelişim programlarını araştırma ve değerlendirme anlamında özellikle öğretmen eğitimcilerine geniş bir perspektif sunmayı amaçlamıştır. Bulgular, öğretmenlerin bilgisayar destekli dil öğrenimi ve öğretiminde söz konusu olan TPAB bilgi ve becerilerinin ince ayarının değerlendirilmesinde yalnızca öğretmen algılarının değil, bu becerilerin edinildiği kurslardaki öğrenme deneyimleri ve uygulamalarının da göz önünde bulundurulmasının önemini vurgular niteliktedir. Bu anlamda araştırma sonuçları, TPAB kuramsal çerçevesi izlenerek oluşturulan bir tasarım yoluyla öğrenme ortamının etkilerine yönelik oldukça kapsamlı bir anlayış oluşmasını da öngörmektedir. Böylesi bir anlayış, öğretmenlerin bilgisayar destekli öğretim/öğrenim becerileri geliştirmesine yardımcı olmakla kalmayıp, bu becerileri günlük eğitim uygulamalarına transfer edebilmelerini kolaylaştıracaktır.

5.1 Gelecek Araştırmalar için Öneriler

Bu çalışma, tasarıma dayalı öğrenme ortamına yönelik farkındalığın gelişmesine dair anlayışı genişletmeyi amaçlamış olup, katılımcı öğretmenler, gerçek öğretim ortamlarında teknoloji kullanımının zorlukları; TPAB gelişiminde teknoloji, pedagoji ve içerik kavramları arasındaki karmaşık etkileşimine dair farkındalıklarını derinleştirmişlerdir. Farklı evrenlerde, özellikle de yapılan çalışmaların oldukça yetersiz olduğu Türkiye'deki eğitim öğrenim kurumlarında söz konusu teori temelli benzer çalışmalar gerçekleştirilebilir.

Bu çalışma yalnızca TPAB olgusu ve onun alt alanlarına dair anlayışın geliştirilmesi için sürekli bir teorik gelişim desteğini vurgulamak değil, aynı zamanda TPAB ve ilgili beceri ve tutum ölçeklerinin ölçümüne dair modifikasyonlara gidilmesinin gereğini de vurgulamaktadır. Bu anlamda bu çalışmada uygulanan TPAB ve bilgisayar tutum anketleri ve benzer ölçüm araçlarının yenilendiği gelecek çalışmalar sayesinde daha anlamlı verilere ulaşılacağı tahmin edilmektedir. Bu sayede, öğretmen eğitim programlarının iyileştirilmesi anlamında daha detaylı araştırmalar gerçekleştirilebilecektir.

Bu çalışma, çevrimiçi olarak Türkiye'de gerçekleştirilen ilk ve tek, EBİT yüksek lisans dersininin katılımcıları üzerinde yapılmıştır. Katılımcılar teknolojiyi düzenli olarak kullanmak ve tüm ders içerikleri, bilgisi ve projelerini çevrimici olmak suretiyle takip etmek ve gerçekleştirmek durumunda olmuşlardır. Bu nedenle benzer ortamların incelendiği gelecek araştırmaların çeşitlendirilmesi tavsiye edilmektedir.