Perceptions of Turkish Pre-Service EFL Teachers on Their Technological Pedagogical Content Knowledge

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Abstract

The purpose of this study is to investigate perceptions of Turkish pre-service EFL (English as a Foreign Language) teachers related to their level of Technological Pedagogical Content Knowledge (TPACK), the factors affecting their perceptions of TPACK, and their beliefs related to technology integration into EFL classrooms. The study employs both quantitative and qualitative data collection and analysis procedures. A total of 94 Turkish pre-service EFL teachers answered two questionnaires designed to gather information about their combining technology, pedagogy, and content knowledge in the ways of both learning and teaching processes. Six of the participants were also interviewed about their perceptions on TPACK competences and their beliefs related to technology use in language teaching. Quantitative data were analyzed by calculating descriptive statistics (frequency, percentage, mean score, standard deviation), and qualitative data were analyzed by using content analysis. The findings related to quantitative data revealed high levels of perceptions on TPACK competences, and the findings related to qualitative data supported the high level of perceived TPACK competences and further revealed that participants emphasized the place of personal interest, experience, knowledge and access while singling out educational support by their own instructors on the development of TPACK. In the light of the findings of the study, it has been suggested that courses offered to pre-service teachers should include how to combine technology, content and pedagogy together for effective instruction in their subject field; and teacher education programs should provide pre-service teachers with the opportunities of becoming the designers of technologically mediated materials.

Keywords: technological pedagogical content knowledge, technology integration, teacher education, perceptions of pre-service EFL teachers

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Türkiye'deki İngilizce Öğretmeni Adaylarının Tekno-pedagojik İçerik Bilgisi ile İlgili Algıları

Öz

Bu çalışmanın amacı, Türkiye'deki İngilizce öğretmen adaylarının Teknopedagojik İçerik Bilgisi (TPİB) ile ilgili algılarını araştırmak ve bu algılarını etkileyen faktörleri ortaya çıkarmaktır. Hem nicel hem de nitel veri toplama yöntemleri ile yapılan çalışmaya 94 İngilizce öğretmen adayı katılmış ve öğrenme-öğretme süreçleriyle alakalı TPİB algılarını ölçmek üzere hazırlanmış olan iki farklı anket yanıtlamışlardır. Ayrıca, katılımcılar arasından seçilen altı İngilizce öğretmen adayı ile mülakat yapılmış ve bu öğretmen adaylarının TPİB ile ilgili görüş, tutum ve inançları daha derinlemesine ortaya çıkarılmaya çalışılmıştır. Nicel veriler betimsel istatistikler (frekans, yüzde, ortalama, standart sapma) kullanılarak analiz edilirken nitel veriler için içerik analizi kullanılmıştır. Nicel veri analizi sonuçları öğretmen adaylarının yüksek derecede TPİB'ne sahip olduklarını ortaya koymuştur. Nitel veri analizi de hem nicel veri analizi sonuçlarını desteklemiş hem de öğretmen adaylarını TPİB ile ilgili görüş ve algılarının kişisel ilgi, tecrübe, bilgi birikimi ve alınan destek ile yakından alakalı olduğunu ortaya koymuştur. Nitel veri analizi de hem nicel veri analizi sonuçlarını desteklemiş hem de öğretmen adaylarını TPİB ile ilgili görüş ve algılarının kişisel ilgi, tecrübe, bilgi birikimi ve alınan destek ile yakından alakalı olduğunu ortaya koymuştur. Çalışmanın nicel ve nitel verilere dayanan ve birbirini destekler nitelikte olan bulguları göz önüne alınarak, İngilizce öğretmeni yetiştirme ile ilgili iki temel öneri sunulmuştur. Bunlardan biri, öğretmen yetiştirme sürecinde verilen derslerde öğretmen adaylarına teknolojiyi derslerinde etkili biçimde nasıl kullanabilecekleri ile ilgili dersler verilmesinin faydalı olabileceğidir. İkinci öneri ise, öğretmen adaylarına, teknoloji ile desteklenmiş ders materyali hazırlamalarına katkı sağlayacak olanakların sunulmasının önemli olduğudur.

Anahtar Sözcükler: teknopedagojik içerik bilgisi, eğitimde teknoloji kullanımı, öğretmen yetiştirme, İngilizce öğretmen adaylarının algıları

Introduction

Rapid developments of computers and instructional technologies have changed the nature of education in the twenty-first century and forced educational institutions to renew themselves in accordance with the advent of recent technologies. Traditional conceptions of what constitutes a classroom, the role of a teacher and the qualities of teacher knowledge have been challenged by the emergence of new technology. As far as the effective technology integration in education is considered, it would be safe to say that it is not only dependent on the appropriate technological tools, but also on the use of these technological tools by teachers.

Koehler and Mishra (2005) suggest that introducing new technologies in education does not necessarily bring about successful teaching and learning experiences, identifying teachers' needs to know about effective technology integration is also very important. Building on Schulman's (1986, 1987) conceptualization of pedagogical content knowledge, Mishra and Koehler (2006) have offered a new framework called Technological Pedagogical Content Knowledge (TPACK), which was proposed to define an integrated conceptual framework for the construction of the knowledge base that teachers should possess for effective teaching with technology.

Technological knowledge has become another dimension of the knowledge base of teaching, and any attempt to meaningfully integrate technology in educational environments requires a need for developing TPACK. Developing and implementing TPACK in teaching creates a need for understanding of how technology is in relation with pedagogy and content (Koehler, Mishra, & Yahya, 2007). In other words, "unless a teacher views technology use as an integral part of the learning process, it will remain a peripheral ancillary to his or her teaching. True integration can only be understood as the intersection of multiple types of teacher knowledge" (Pierson, 2001, p. 427).

While the importance of TPACK is clear, some teachers may remain unclear about how to use technology to support their teaching (Niess, 2005). Although they sometimes use the Internet to attract students' attention, they may have very little knowledge about how to effectively integrate technology to facilitate students' development (Lee & Tsai, 2008). In addition to lack of necessary knowledge, some teachers may also not have relevant experience in using technology to assist their teaching and their attempts may be limited in scope (Koehler, Mishra, Kereluik, Shin, & Graham, 2013). The main reason for their insufficient qualities in technology integration may stem from their undergraduate pre-service teacher training (Angeli & Valanides, 2005; Koehler, Mishra, & Yahya, 2007). Despite a variety of technological tools and increasing opportunities to help pre-service teachers to practice technological skills, little attention has been given to pre-service teachers' experiences in teaching with technology during their practicum (Kurt, 2012). Without such an experience, pre-service teachers may tend to use technology in superficial and low-level ways (Doering & Veletsianos, 2008). Thus, pre-service teacher education plays a crucial role in determining the effectiveness of technology integration into education (Snider, 2003).

Taken together, aforementioned observations may show that teacher education programs need to help pre-service teachers understand how technology can be incorporated into teaching content and support them to develop a critical knowledge base for TPACK. In order to help, teacher education programs should first determine pre-service teachers' perceived TPACK competences, which refer to their understanding of the interaction

between technologies and pedagogical content knowledge. In the light of this examination, teacher education programs can get to know the competences of groups with which they are working, and then hopefully provide better teaching and learning experiences for their students. From this point of view, this study aims at answering the following research questions: (1) What is the level of a group of Turkish pre-service EFL teachers' technological pedagogical content knowledge; (2) What are the perceptions of a group of Turkish pre-service EFL teachers on their technological pedagogical content knowledge?

Background to the Study

Traditionally teachers' knowledge bases were emphasized on two forms of knowledge: content knowledge (the 'what' of teaching) and pedagogical knowledge (the 'how' of teaching), and they were treated as mutually exclusive. Shulman (1986, 1987) criticizes teacher education programs for treating content knowledge and pedagogical knowledge as separate domains of teacher knowledge bases. Arguing that neither pure content knowledge nor pure pedagogical knowledge was enough for teaching, Shulman introduced a new type of knowledge base which is called pedagogical content knowledge (PCK) (Gess-Newsome, 1999). With the concept of PCK, Shulman refers to the interconnectedness of pedagogy and content, and suggests that teachers should have an in depth understanding of how to integrate these multiple domains of knowledge. In other words, Shulman's framework focuses on pedagogical content knowledge as the intersection of subject-specific knowledge and pedagogical knowledge, and highlights the importance of the need for teachers to understand various ways of representing subject matter.

In the mid-1980s, when Shulman first proposed PCK framework, the number and the range of educational technology tools and resources were relatively limited. In the PCK concept the emphasis was mainly on how pedagogy and content are related in teaching. In the intervening years, however, several educational technological developments have occurred. With the advent of digital educational technologies and their appearance in educational settings, educators have started to think that technology knowledge cannot be considered as an isolated construct, and effective teaching necessitates the understanding of how technology is associated with pedagogy and content (Mishra & Koehler, 2006). Addressing this limitation in the PCK framework, Mishra and Koehler (2006) suggested that technological knowledge (TK) should be included as a third knowledge base in Shulman's (1986) PCK framework. By adding this third knowledge base, Mishra and Koehler have developed a new framework called Technological Pedagogical Content Knowledge (TPACK) and attempted to explain the dynamic relationships among content knowledge, pedagogical knowledge, and technology knowledge. The TPACK framework comprises three major components of knowledge: content (CK), pedagogy (PK) and technology (TK), and their intersections represented as pedagogical content knowledge (PCK), technological content knowledge (TCK), technological pedagogical knowledge (TPK), and technological pedagogical content knowledge (TPACK) (Koehler & Mishra, 2005; Mishra & Koehler, 2006).

Figure 1. *Technological pedagogical content knowledge (tpack) framework (http://tpack.org)*
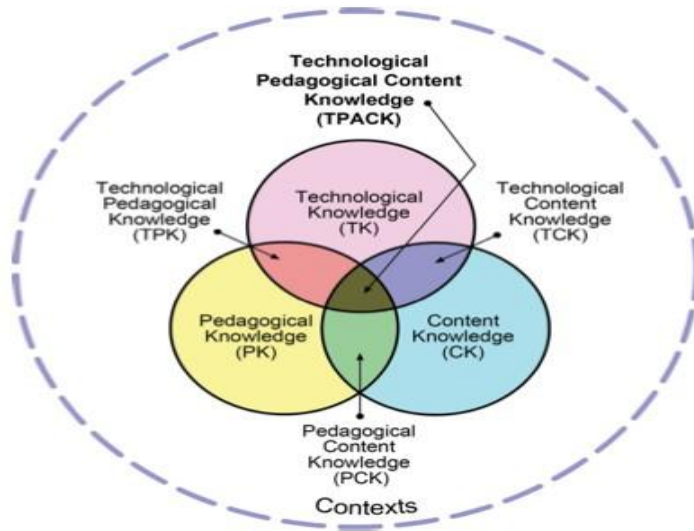

Figure 1 presents the seven categories of TPACK. These categories can be briefly defined as follows:

a) Content Knowledge (CK): This refers to the type of knowledge that teachers need to have about the subject matter. In other words, CK is the knowledge of 'what' to teach. It consists of theories, terms, ideas and constructs (Shulman, 1986).

b) Pedagogical Knowledge (PK): It includes the knowledge of the teachers about practices, processes and methods necessary for teaching (Koehler, Mishra, & Yahya, 2007). PK also comprises understanding of how learners get to learn, classroom management strategies, lesson planning, and student assessment. Therefore, it requires teachers to understand cognitive, social and developmental theories of learning and to have the necessary skills to administer them in the classroom.

c) Technology Knowledge (TK): This knowledge includes skills which are required to use various digital technologies in learning environments such as computers, internet, interactive whiteboards, mobile devices and software applications (Schmidt et al., 2009).

d) Pedagogical content knowledge (PCK): It refers to the content knowledge that is applicable to the teaching of a certain subject matter (Schulman, 1987). PCK is different for various subject areas because PCK requires combining subject with instruction (Schmidt et al., 2009). A teacher with PCK is therefore, required to have the ability to design and practice the content matter to be taught (Mishra & Koehler, 2006).

e) Technological Content Knowledge (TCK): This knowledge requires not only the knowledge of content areas to be taught but also having the ability to teach content matter via technology (Koehler, Mishra, & Yahya, 2007). Therefore, teachers should have an understanding of their subject areas and the use of technologies that facilitate student learning.

f) Technological Pedagogical Knowledge (TPK): This knowledge consists of an understanding of how pedagogical strategies can be applied to the use of numerous technologies (Margerum-Leys & Marx, 2002) and how using of these technologies may change teachers' instruction in classrooms (Schmidt et al., 2009).

g) Technological Pedagogical and Content Knowledge (TPACK): As the core of the model, TPACK is the intersection among the three key interdependent knowledge bases (PCK, TCK, and TPK). In this model, teachers' understanding of technology, pedagogy, and content interact with one another in order to employ effective teaching with educational technologies (Harris, Mishra, & Koehler, 2009).

Overall, these definitions indicate that TPACK is greater than that of the sum of its parts. It is TPACK that enables teachers to determine a 'fit' between the content focus, pedagogical approaches and educational technologies. Understanding the knowledge and skills required for technology integration into the classroom has increased the significance of teachers' development of TPACK. In this regard, teacher education programs have become a key area for the implementation of the TPACK framework (Maor & Roberts, 2011). Researchers have begun to focus on specific approaches to help teacher candidates develop their TPACK. Schmidt et al. (2009) state that "there is a continual need to rethink our preparation practices in the teacher education field and propose new strategies that better prepare teachers to effectively integrate technology into their teaching" (p. 126).

In Turkish context, although research on teachers' TPACK have noticeably increased in recent years, studies mainly focus on pre-service teachers' development of TPACK in the content fields such as science, mathematics, physical education, or social sciences (Yaman, 2007, 2008; Mavi, 2007; Yilmaz, 2008; Erdoğan & Şahin, 2010; Yilmaz, Ulucan, & Pehlivan, 2010; Kabakçı-Yurdakul, 2011; Semiz & Ince, 2012), and the number of studies implemented to investigate the pre-service English teachers' perceptions on TPACK is limited (Öz, 2015; Tunçer, 2014; Solak & Çakır, 2014). The present study attempts to provide further insight into the issue, and therefore it aims to investigate Turkish pre-service EFL teachers' level and perceptions of TPACK.

Method

Participants

Ninety-four Turkish pre-service EFL teachers studying in their final semester of the EFL teacher education program of a Turkish public university participated in the present study. Of the 94 students, 78 (83%) were female and 16 (17%) were male, and their mean age was 22.40. According to the results of the background questionnaire, all the participants had their own computers and 80 of them (85.1 %) had a smartphone. Their internet use was as follows: 37 (39.4 %) of them 'almost always', 27 (28.7 %) of them 'usually', 16 (17 %) of them 'often", 4 (4.3 %) of them 'sometimes', 1 (1.1 %) of them 'rarely', and 9 (9.6 %) of them 'almost never'.

Instruments and Data Analysis

One of the data collection instruments of this study was the 'TPACK-Deep Scale', which was developed based on Mishra and Koehler's (2006) model by Kabakçı-Yurdakul et al. (2012) for the purpose of assessing technological pedagogical content knowledge. The scale consists of 33 items answered on a 5-point scale ranging from 'strongly disagree' to

'strongly agree'. According to the evaluation criteria of the scale, the obtained total scores that are equal to or lower than 95 refer to 'low level of TPACK'; scores that are between 96 and 130 refer to 'average level of TPACK'; and scores that are higher than 130 refer to 'high level of TPACK'. The Cronbach's alpha coefficient of the scale had been calculated as .95 by Kabakçı-Yurdakul et al. (2012) and the same coefficient (.958) was found for the administration of the scale for the present study.

In addition to the TPACK-Deep Scale, participants were also given a background questionnaire (adapted from Tunçer, 2014) which consists of four parts asking questions in relation to (1) demographic information, (2) personal experiences in terms of technology use, (3) educational background with regard to technology use, and (4) teaching experiences with regard to technology use.

Apart from the questionnaires, six participants were interviewed in order to investigate how and to what extent they can integrate technology into their English teaching practices, and to discover their perceptions related to technology integration into English language teaching. The following three interview questions were asked to the participants: (1) As a prospective foreign language teacher, do you think that you can use technology for educational purposes?; (2) What factors have positively influenced your beliefs related to technology integration into English language teaching classrooms during your practicum experiences?; and (3) What factors have negatively influenced your beliefs related to technology integration into English language teaching classrooms during your practicum experiences?

Quantitative data of the study were analyzed by calculating descriptive statistics (mean score, standard deviation, frequencies, and percentages). For the analysis of the qualitative data collected via interviews, participants' responses to interview questions were transcribed and categories in accordance with their responses were identified. Those categories were used to form themes and these themes were compared with the ones identified before in the literature.

Findings

TPACK and Use of Technology in the EFL Classroom

The TPACK-Deep Scale mean score of all the participants of this study was found to be 132.16 (SD = 15.685), which indicates a high level of perception in TPACK. The highest score was 165 while the lowest one was 66. Of all 94 participants, two participants were found to be in the 'low level of TPACK', 32 participants were found to be in the 'average level of TPACK', and 60 participants were found to be in the 'high level of TPACK'.

Figure 2 presents the number of participants who integrate technology for different skills and areas in varying rates. As the figure illustrates, 81 (86.2%) participants reported using technology for listening activities, 65 (69.1%) for vocabulary activities, 52 (55.3%) for speaking activities, 42 (44.7%) for grammar activities, and 37 (39.4%) for writing and reading activities.

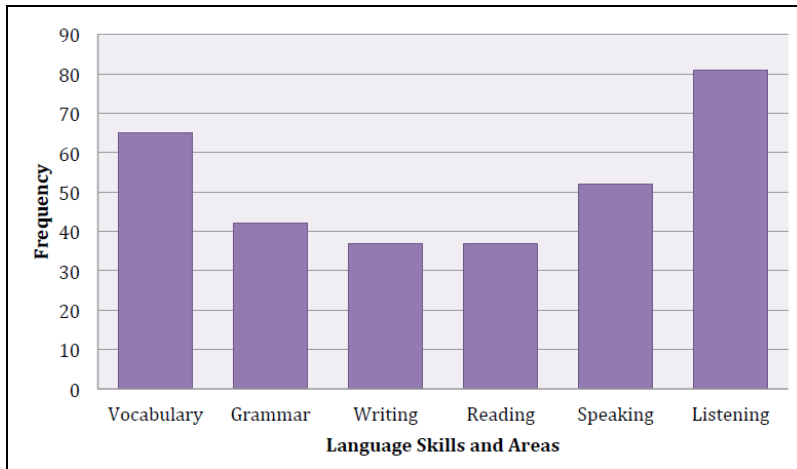Figure 2. *Technology use for various language skills*

Figure 3 demonstrates participants' use of technology for various reasons during the lesson preparation. As the figure presents, participants reported that they use technology for various reasons while preparing their lessons. Eighty-nine (94.7%) participants used technology for finding authentic and visual materials, 82 (87.2%) for finding visual materials, 79 (84%) for the preparation of lesson plan, 69 (73.4%) for sharing their ideas with their colleagues, 66 (70.2%) for sharing their lesson plans, 59 (62.8) for motivating their students, and 53 (56.4%) for getting advice from their colleagues.

Figure 3

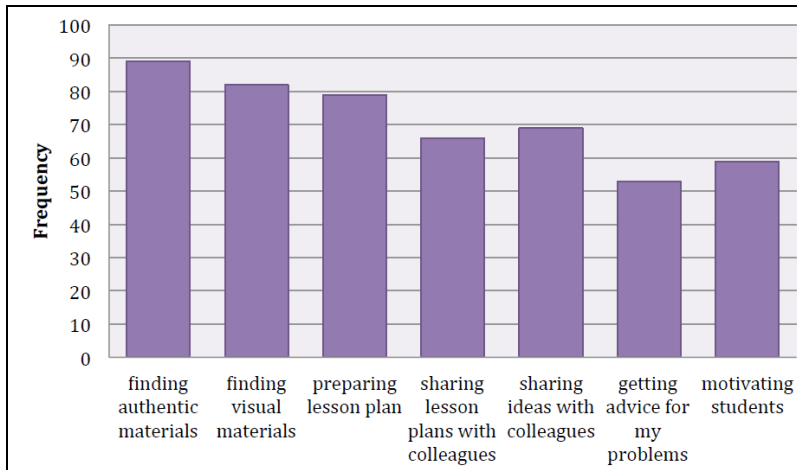*Reasons for Technology Use during Lesson Preparation*

Figure 4 presents participants' plans related to technology use while teaching English in their future classes. It's seen in the figure that 22 (23.4%) of them reported that they are planning to use technology 'almost always', 36 (38.3%) reported 'usually', 25 (26.6%) 'often', and 10 (10.6%) 'sometimes'. Only one participant stated that she was planning to use technology 'almost never' in the future.

Figure 4. *Future plans for using technology in English language teaching*
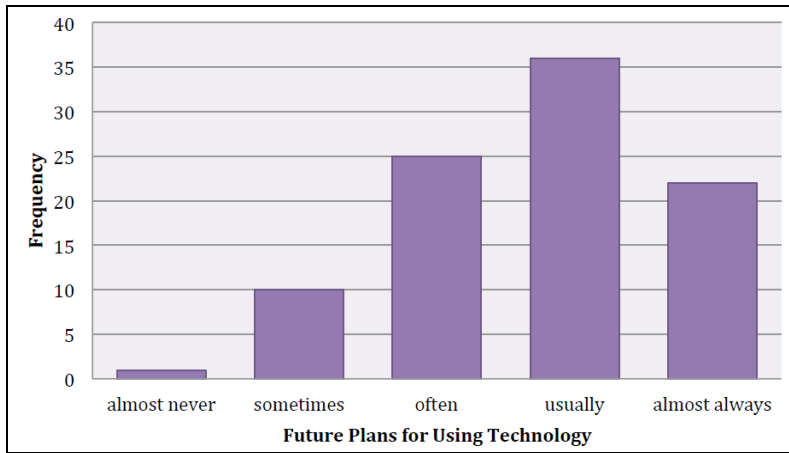
Perceptions Related to TPACK Competences

Participants' responses to the first interview question were analyzed in two categories: competence and incompetence. For competency, four, and for incompetency three main factors emerged from the data. Table 1 presents these factors.

Table 1. *Perceptions related to TPACK competences*

	Factors	Number of Students
Competence	I can use technology for educational purposes (curricular tasks, presentations)	6
	ELT requires me to use technology	4
	I am eager to use technology for educational purposes and keep myself updated	4
	'Digital Material Development for ELT' course has improved my technology integration skills	3
Incompetence	I lack of models of teachers providing enough guidance for technology integration into language teaching	3
	I cannot keep myself updated	2
	I do not have enough information for adapting technology to language teaching	2

Table 1 indicates that participants seemed to have an awareness of using technology in language teaching and learning situations. Nearly all of them asserted their competence in technology use. However, two participants expressed some concerns related to adapting technology to language teaching. The following is an excerpt from the interview of one of those two students:

> "I strongly believe I possess competence for technology use. But, I think this does not mean that I can successfully integrate my skill into my content and pedagogy knowledge. Technology use in language teaching requires different

skills which are more than simply knowing and being competent in using technology for personal reasons. Technology integration seems to me necessarily beyond making PowerPoint presentations or Internet searching."

Some participants emphasized the important role of an elective course (Digital Material Development for ELT) they took on their development of TPACK. These participants also referred to the distinctive increase in their eagerness to integrate technology into their teaching during practicum. One of these participants explains the benefits of the course as follows:

"In the first term of this year, I enrolled in a course, namely 'Digital Material Development for ELT'. In this course, we prepared digital materials every week by considering the content we teach at practicum schools. This course helped me a lot in terms of understanding how to integrate technology into content and pedagogy knowledge. At the end of the term, I had the sense of improvement in my teaching skills. That made me motivated and eager to learn more for technology integration."

Some participants explained their incompetence in using technology effectively while teaching English with lack of enough guidance provided by their university instructors or practicum school teachers. One of the students illustrated this situation as follows:

"When I look back and reflect on my teaching practices, I see that I do not include much technological tools or materials into my teaching. The reason, I guess, is due to my lack of knowledge on how to design technologically assisted lessons. In my courses at university, we are generally provided with content knowledge and how to present this content knowledge through steps. My teachers at university and practicum schools neither particularly emphasize technology use nor they themselves present such technologically mediated courses. I guess that's why I do not employ technology use much."

Data analysis related to participants' answers to the second interview question revealed 4 factors identified as positive contributors to their beliefs related to technology integration into English language teaching classrooms during their practicum experiences. Table 2 presents those factors.

The most commonly expressed factor is found as 'technology integration into teaching fosters individualized learning'. All of the interviewees identified an overall positive impact on their students' learning process. They believed that technology integration enables individualized learning through selecting instructional materials, and it can be adapted to students' different learning styles via designing appropriate materials.

Table 2. *Positive factors influencing pre-service teachers' perceptions related to technology integration into EFL classrooms*

Factors	Number of Students
Technology integration fosters individualized learning	6
Technology integration makes learning interesting, engaging, and interactive	5
Usability and cost effectiveness of computer-assisted instructional materials	5
'Digital Material Development for ELT' course	3

By appropriate materials, they referred to well-designed instructional materials (i.e. audio, video, animation or simply visuals), and emphasized on meeting the specific needs of individual students through wide range of computer-assisted materials. In this regard, one of the students expressed the following:

> *"I believe that technology integration enables effective instruction where the subject and students' pace of learning are adapted to their individual needs. Contrary to traditional classroom instruction, this method emphasizes each student's learning demands."*

To name another positive factor, interviewees believed that integrated technology tools make learning interesting, engaging, and interactive. Accordingly, they stated that technology makes learning fun and colorful, and it keeps learning environment alive and active. One of the participants illustrated this situation with the following expressions:

> *"Technology offers us a wide range of opportunities for interactive learning. For instance, you can easily create and post podcasts for your learners who were absent or want to revise....With the help of technology, I can get more students engaged as well as foster collaboration, and most importantly make learning interesting! YouTube is an amazing tool for this."*

Interviewees also addressed an overall positive impact of usability and cost effectiveness of computer-assisted instructional materials. With regard to this, they explained that traditional information resources (i.e. worksheets, handouts) are more costly, and generally funded by the students of the teachers; however, materials designed through technological tools are free of charge and most importantly, more innovative and up-to-date.

Also, three of the interviewees considered "Digital Material Development for ELT" course as a contributor and a positive factor for synthesizing their knowledge, and gaining skills, capabilities and attitude to integrate technology with appropriate materials.

Finally, Table 3 presents the participants' answers to the third interview question. As the table indicates, five negatively influencing factors were identified as a result of data analysis.

Table 3. *Negative factors influencing pre-service teachers' perceptions related to technology integration into EFL classrooms*

Factors	Number of Students
Time consuming	6
Mentor teacher's reluctance	4
Insufficient guidance	3
Technical problems	3
Lack of knowledge	1

As Table 3 indicates, most commonly expressed negative point is time. All of the participants reported that designing computer-mediated materials requires too much time and effort. One of them explains as follows:

"I try to use different interactive presentation programs to create attractive digital materials. These materials make students interested in materials and therefore, help me take their attention on the content. However, I spend too much time on preparing such kind of materials."

A number of participants voiced the complaint about mentor teachers' being reluctant to encourage them to use technological tools in their classrooms during teaching practicum. One of the participants expressed her opinion based on her experiences as follows:

"At the beginning of my teaching practices, I used to include technology into my lessons because students got motivated. Each time I came to class, they started to wonder and ask their teacher whether I would present or not. When the answer was no, they immediately got upset. I guess, they associated me with my different digital activities and that's why they wanted me to teach. As far as I understand, their teacher used smart board just for listening activities. She did not have appropriate knowledge to effectively integrate technology into classroom. I think, because of her insufficiency, she wanted me to use the course book activities, and do nothing more than that."

Apart from mentor teachers at practicum schools, some of the participants mentioned their instructors at university and stated that the instructors did not provide enough guidance for technology integration into teaching.

Some participants also stated 'technical problems' (i.e. insufficient access to Internet, slow Internet connection, hardware problems) as negative factors. Also, one interviewee stated her lack of knowledge for effective use of technology in language teaching as a negative factor.

Discussion and Conclusion

When the findings of the present study are compared with the results of other studies conducted with similar purposes, it is seen that the results of the current study demonstrate a lot of similarities with the findings of previous studies (Tunçer, 2014; Kabakçı-Yurdakul, 2011; Ceylan et al., 2014). However, a difference was found between the results of the current study and Tunçer's study (2014). The findings of Tunçer's study revealed that participants have either high or avarage level of TPACK but the current study found that two pre-service teachers' scores were in the low level of TPACK.

It was revealed in this study that almost all of the interviewees agree on the importance of technology integration into English language teaching. They reported that English language teaching necessitates technology use in classrooms especially in terms of listening activities and the presentation of visual and authentic materials. Although all of the interviewees referred to the importance of technology use in English language teaching, majority of them reported varying levels for using technology in their future classes. The leading reason for this was expressed as the condition of teaching environment. Likewise, one participant who was eager to use technology in his/her teaching in Tunçer's study (2014) stated that his/her ideas about technology integration can only be valid in a school environment where the technology integration is encouraged. Niess (2005), and Littrell, Zagumny, and Zagumny (2005) laid an emphasis on the significance of accession to technology in the classroom.

In this study the analysis of the qualitative data about positive factors revealed that the participants believed that technology integration enables individualized learning and makes learning interesting, engaging, and interactive. According to the Office of Technology Assessment (OTA, 1995) report, individualizing student learning has been the greatest appeal of technology use in the classroom setting. Accordingly, integrated learning systems and software that corresponds to curricula can be implemented due to students' abilities (OTA, 1995). OTA (1995) also stated that the nature of technology based resources and discussions with teachers suggest that various technology based classroom activities can be motivating to students.

The analysis of the qualitative data about negative factors revealed that all of the interviewees believed that technology integration can be time consuming for teachers. As Top (2007) stated, integrating technology into instruction can be a difficult, time-consuming process; however, "only those teachers who believe that technology use will lead to significant benefits for their students will undertake the associated challenges" (p.40). As Russell et al. (2003) expressed "teachers entering the profession need to develop positive beliefs about technology and skills to use technology in a wide variety of ways" (p.308). Another negative factor revealed in the present study was cooperating teachers' being reluctant to motivate pre-service teachers to use technological tools in their classrooms during practice teaching. In relation to this, one of the barriers in front of the effective technology integration endeavors defined by Dooley (1999) as teachers' habit of teaching in the manner in which they themselves were taught. At this point, our findings suggest that the level of support received from cooperating teachers can be one of the most important determining factors in whether the pre-service teachers incorporated technology into their classrooms or not (Öz, 2015). The interviewees also stated that they would expect their university instructors to be better role models for technology integration. This result supports the findings of Semiz and İnce (2012), and İnce and Ok (2005) who suggested that pre-service teachers accepted their own university instructors as role models when they had a chance to observe their modeling of technology integration.

To conclude, this study suggests that the participating Turkish pre-service English language teachers' levels of TPACK competence are at satisfactory level. Also, the participants of the study emphasized the place of personal interest, experience, knowledge and access while singling out educational support by their own instructors to the development of TPACK. In line with these, the present study has some implications for teacher education programs. With regard to pre-service teachers' effective technology use in their teaching, the role of teacher education programs is becoming increasingly apparent since such technology incorporation necessitates a relatively sophisticated and interrelated understanding of the technology, pedagogy, and content. Therefore, it can be suggested that courses offered to pre-service teachers should include teaching pre-service teachers explicitly how to combine technology, content and pedagogy together for effective instruction in their subject field. That is, the courses should combine coursework with fieldwork to equip pre-service teachers with the necessary skills of technology integration. This especially puts emphasis on the roles of university instructors as good role models for the use of technology and as supporters of technology integration. Apart from offering courses, teacher education programs should also provide pre-service teachers with the opportunities of becoming the designers of technologically mediated materials and experiencing technology assisted instruction through the use of these materials at practicum schools. In other words, as Niess (2008) states, "no matter how marvelous the coursework is in providing them with knowledge about teaching with technology, they must have opportunities to apply this knowledge" (p. 246).

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