Examining Teachers' Self-efficiency Regarding Web Pedagogical Content Knowledge Framework

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ABSTRACT

Technology has been always important for all industries and due to the dramatically increase and its influence of it in education, in the last decades there has been a crucial need for teachers to learn how to adopt, integrate and apply new technologies in their instruction. Accordingly, this study investigated the level of teachers' knowledge in Web Pedagogical Content Knowledge (WPCK) framework with respect to some of their personal characteristics such as age-range, gender, years of experience in teaching, division of teaching, and access to the internet outside the school. To fulfill this, a survey implemented in Eastern Mediterranean University (EMU) targeting all teachers in foreign language and English Preparatory School including (FLPS) total number of 167 instructors. A questionnaire called Technological Pedagogical Content Knowledge-Web (TPCK-W) developed by Lee and Tsai (2010) has been applied by this study as a survey instrument. As a result of measuring coefficient, mean, standard deviation, and probability value (P-value), this study found high level of knowledge in WPCK framework as well as notable positive attitude toward the Web-based instruction. Furthermore, some significant correlations have been found in some different factors of Web-general (WG), Web-communicative (WC), Web pedagogical content knowledge (WPCK).

Keywords: TPCK-W, Technological Pedagogical Content Knowledge-Web

ÖZ

Teknoloji tüm endüstriler için her zaman önemli olmuştur ve eğitimdeki etkileyici bir şekilde artması ve etkisi nedeniyle, son yıllarda öğretmenlerin derslerinde yeni teknolojileri nasıl kullanacaklarını, entegre edeceklerini ve uygulayacaklarını öğrenmeleri çok önemli bir ihtiyaç olmuştur. Buna göre, bu çalışma öğretmenlerin Web Pedagojik İçerik Bilgisi (WPİB) çerçevesindeki bilgi düzeyini, yaş aralığı, cinsiyet, öğretim deneyimi, öğretim kümesi ve okul dışında internete erişim gibi bazı kişisel özelliklerine göre araştırmıştır. Bunu yapmak için, Doğu Akdeniz Üniversitesi (DAÜ) ' de, Yabancı Dil ve İngilizce Hazırlık Okulu'ndaki (YDİHO) toplam 167 öğretim üyesi olmak üzere tüm öğretmenleri hedefleyen bir anket uygulanmıştır. Bu çalışmaya, Lee ve Tsai (2010) tarafından geliştirilen Teknolojik Pedagojik İçerik Bilgisi-Web (TPİB-W) adı verilen bir anket uygulanmıştır. Ölçme katsayısı, ortalama, standart sapma ve olasılık değeri (P-değeri) sonucunda, bu çalışma WPİB çerçevesinde yüksek düzeyde bilgi ve web tabanlı öğretime yönelik kayda değer olumlu tutum bulmuştur. Ayrıca, Web-genel (WG), Web-iletişimsel (Wİ), Web Pedagojik İçerik Bilgisi (WPİB) gibi farklı faktörlerde bazı önemli korelasyonlar bulunmuştur.

Anahtar Kelimeler: TPİB-W, Teknolojik Pedagojik İçerik Bilgisi-Web

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Chapter 1

INTRODUCTION

One of the big challenges in the recent years is technology which is growing rapidly and sharply. Regarding to this, technology plays a substantial role in all industries and so many other areas and has a deep influence on them today. The importance of digital technology in innovation, improving, and developing new technologies provide an interesting space for different area to apply this kind of technology in their careers. Education is one of the important areas which there has always been concern in adopting and utilizing new technologies to improve the methods of teaching and learning and raise the level of knowledge as a result of instruction.

For this purpose, some investigations have been conducted (e.g. American Association for the Advancement of Science [AASS], 1989, 1993, 1998; Black & McClintock, 1996). In addition to these researches mentioned above, Bates and Poole (2003) discussed that there is a strong relationship between teaching, learning, knowledge and technology in education. In fact, each of these factors plays a very important role in instruction, also they are interrelated to each other. In addition, it was argued that in order to implement a proper teaching environment all these factors should be considered. In the other words, a suitable manner is needed for the integration of learning, teaching with technology.

Vrasidas and McIsaac (2001) were concerned about the integration of technology in education and they claimed that, because of the influence of technology in todays' instruction, it needs to be informed based on integration of technology in education. Furthermore, it was argued that, today computer devices and the Internet are available everywhere and they have influence in education especially in the progressed countries. For example, in the USA almost all schools have access to the Internet. Accordingly, technology is an undeniable factor of todays' instructions and reforming the manner of teaching and learning in terms of using and integrating it in education can increase the motivation and engagement of students through corporative activities. Thus, it will lead to improvement in quality of education. In this respect, teachers also need to be trained to gain proper and adequate skills. These skills which called "computer literacy" were mentioned as a necessary information about the way of using computer technology which teachers can attain during the meaningful task.

Tsai (2001) emphasized on the constructivist view of teaching in terms of Internet-based instruction. Tsai discussed that, learning in the constructivist perspective is a process in which teachers and students are engaged in construction and interpretation. In fact, teachers do not be considered as a tool for teaching rather they play role as facilitator. Actually, the idea of Internet-based instruction is to engage students and teachers in both students with students and students with teachers' collaboration. In the other words, they collaborate and cooperate in classroom activities through using Internet. As a result of this, the level of students' knowledge will be improved.

Chou and Tsai (2002) argued that after the invention of computer network technology designers begun to use this technology as an alternative for manner of design, which also curriculum designer and teachers used it to improve and develop their curricula

design. Thus, faculty members and curriculum designers which may use the Internet for social interaction or other practices, also need to be trained in order to be able to use the Internet-based and Web-based technology in their curriculum. This way, they can find a suitable manner to use and integrate Internet-based technology in order to enhance the learning process and improve the learning outcomes.

Lee and Tsai (2005) claimed that, the rapid progress of technology caused development of several technological tools in order to support learning and teaching. It was also discussed that, a constructivism Internet-based learning environment is able to provide an environment which students and teachers can discuss, use several online sources, practice and think reflectively. Hence, these factors help students to engage more in the activities and also teachers to be able to connect more to their students which this cause an increase in the outcomes of learning.

Pyle and Dziuban (2001) argued that due to the progress of technology on the Internet and World Wide Web (WWW) and its tendency to integrate with online pedagogy, it should be used to make-up the manner of learning and teaching in order to meet the requirement of the instruction. Also, it was mentioned that there is a concern in using progressed instructional technology as an instruction or instructor instead of using it to assist and minister the instruction. As a result, two problems were referred which caused by that. The first problem was that teachers see a new technology as a new tool to communicate with their students rather than focusing on how they can use it to improve the teaching and learning process. Moreover, the second problem which mentioned was that, these new instructional technologies need time to be assessed and taught to see if they are efficient and effective enough. They also discussed that, because the Web-based technology is new and is updating rapidly, instructors are

always busy to learn it instead of using it. So there is always need for assessment to determine whether teachers have enough knowledge of Web-based technology or not.

Moreover, cognitive engagement and participation of learners in online discussion with teachers are vital components that can use to define a better perception of the knowledge in teaching and learning procedure. Actually online discussion has a significant role to provide an interesting and motivating environment for learning and teaching (Zhu, 2006).

In addition to that, Neo (2003) purposed that designing a web-based learning environment could be an effective manner to encourage learners in collaborative and corporative activities in order to enhance their problem solving skills.

Shulman (1986) presented pedagogical content knowledge (PCK) as a knowledge which teachers need to have of instruction. This work described pedagogical knowledge (PK) of teaching not only as something separate from subject matter rather as something about teacher's knowledge in managing and organizing the classroom. In addition to that, it was discussed that, content knowledge (CK) is a knowledge which is required teachers to have about the content of teaching according to their perception, imagination, and direction. Therefore, CK organize the origin of their understanding of teaching the subjects.

After a progress of technology Mishra and Koehler (2006) determined a framework for educational technology based on Shulman (1986) definition of PCK. In this regard, it was argued that in order to bring technology into teaching there are some essential needs of qualification of teacher's knowledge about the technology. Accordingly,

integrating technology into instruction should be developed by complexity and also in appropriate form of knowledge which they named it Technological Pedagogical Content Knowledge (TPCK).

Lee and Tsai (2010) claimed that due to the influencing and usage of Web-based technology in education, a new online pedagogy was formed. Thus, teachers need to have efficient knowledge in terms of using and integrating Web-technology in instruction. This knowledge includes the knowledge of content, pedagogy and Web related to the instruction. Therefore, TCPK framework adopted as a suitable framework. This framework was able to cover all the area of knowledge which were needed to integrate Web-technology into the instruction. As a result, a framework was developed called Technological Pedagogical Content Knowledge-Web (TPCK-W). The framework has shown in below.

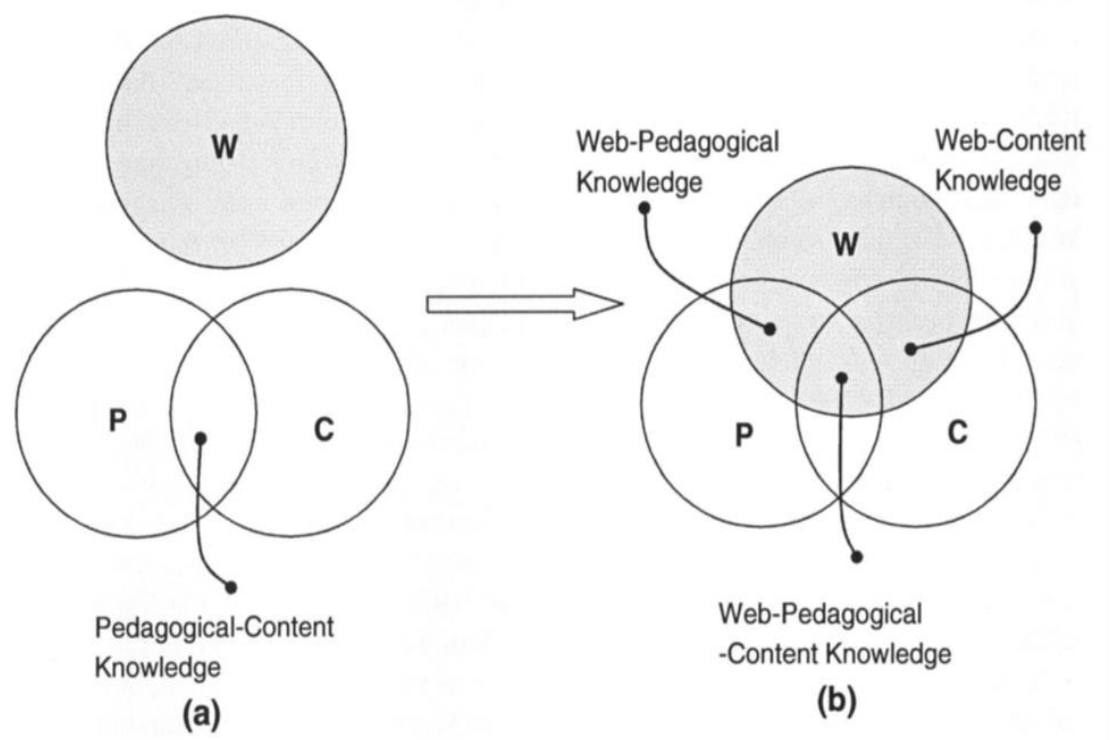

Figure 1. Technological Pedagogical Content Knowledge-W Framework (this figure has been taken from (Lee & Tsai, 2010, p. 4)).

In another study, Gökçearsalan, Karademir and Korucu (2017) referred to TPCK as a framework to create a learning and teaching environment based on utilization of technology with respect to their level of knowledge in web technology, content, and pedagogy. This study aimed to realize the role of web pedagogical content knowledge in today's instruction and how much important it is.

1.1 Background of Studies

During the last decade some scholars investigated teachers' self-efficacy of using TPCK and TPCK-W in education. Abbitt (2011), for example, conducted a research to find the connection between K-12 teachers' self-efficacy beliefs and TPCK. In order to fulfill that, a pre-test and post-test group was designed. The results indicated some changes in complexity of correlation between teachers' self-efficacy beliefs and knowledge. In addition to that, it was found that, there were some changes in the importance and significance of TPCK knowledge framework for k-12 teachers to help them to integrate technology in classroom in order to design successful learning environments.

Furthermore, Yeşiltaş (2016) analyzed perception level of WPCK framework between social studies teachers in Turkey, investigating 601 teachers from 75 cities who were chosen randomly from social studies. Results indicated great level of understanding of WPCK for those teachers.

In addition, Su, Huang, Zhou, and Chang (2017) claimed that no study was conducted about the teachers' level of competency in adopting and integrating Information Communication Technology (ICT) into their instruction in Mainland China. In this respect,, an investigation intended to develop a module tool based on 7 elements

Mishra and Koehler (2006) framework of TPCK was implemented which this specific framework was adopted to measure competency level of geography teachers of Senior high School in Mainland China. In order to implement the survey, an email was sent to the teachers including an invitation to participate in the study and the TPCK questionnaire. As a result, 869 valid answers from 9 different provinces were received. In addition, a Confirmatory factor analysis was conducted in order to prove convergent validity and discriminant validity of the scale and 7 factors of TPCK. The results also illustrated that the data represented the good validity with 39 scaled variables factor loadings range between 0.57 and 0.94, and good multiplex validity of each factor ranging between 0.87 and 0.93.

1.2 Problem Statement

The main challenge in adopting TPCK-W or other kind of technologies in education is the manner which teachers use to perform it in their curriculum. So the problem is teachers need to have certain skills to find and choose the best fashion of performing those technologies in their classrooms. In the other words, they require to have self-efficacy of adopting technologies, in this case TPCK-W. To support these issues, some studies which have implemented in this area can be referred as (e.g., Kavanoz, Yüksel and Ozcan, 2014; Hiğde, Uçar and Demir, 2014; Lee & Tsai, 2005; Lee & Tsai, 2010). These studies above were all investigated one of the most challenging area of using WPCK which is self-efficacy of the teachers. Interestingly, the results indicated that all the participants had high level of self-efficacy in terms of WPCK. Furthermore, no significant differences in gender and departments regarding to their perception level of TPCK-W and Web-based instruction was found. Also, some differences were found in adopting this framework with regard to years of experience in using Web-based tools. For instance, more experienced teachers tended to use traditional way of

teaching which they had enough self-efficacy in it, whereas, less experienced teachers tended to find more self-efficacy in Web-based instructions. Moreover, there were no significant differences between different grades and how much time they use internet. In the other words, it was found that the time which teachers spent using internet did not have significant effect on their grads.

As those the results of those study above showed, there are some factors which can caused negative effect on the teachers' level of self-efficacy and their knowledge in Web-based technology. In line with those findings above this study have attempted to find about the problems in applying the Web-technology in instruction with respect to their characteristics such as age, gender, years of experience and so on. In the other worlds, this study aims to find any possible negative which may cause by the characteristics of teachers. Another problem is, teachers' negative attitude toward using Web-technology, because having a negative attitude is an important reason that teachers show low level of self- efficacy in Web-based instruction. Furthermore, there is need for investigating more factors which have negative effects on the teachers' level of knowledge in WPCK. For instance, when teachers don't have access anywhere and anytime they cannot use this technology properly, therefore, they cannot gain enough knowledge of it. Moreover, no study have investigated the age-range of the teachers which can be so effective on their level of self-efficacy.

1.3 Significance of This Study

This research is significant due to the progress of technology (especially in Web technology) and its influence in pedagogy and education. So it is quite important for today's instructional designers to know how they can integrate Web-technology in

instruction and curriculum. With this respect, this study adopted Lee and Tsai (2010) TPCK-W framework which is an efficient framework to find about:

- The perception level of FLEPS English teachers of Web-based instruction in Eastern Mediterranean University (EMU). This can help FLEPS administrators to gain a better view of what is the teachers perception level and what work needs to be done to improve their level of knowledge in Web-based technology.
- The instructors' attitude toward the Web-technology in their curriculum. This will give the FLEPS administrators an overview of what is the teachers' point of view in adopting, utilizing, and integrating Web technology in education.
- The most important thing, this study provided a demographic form consisting: Age-range, Gender, Years of experience in teaching, Internet access outside school, and the division of teaching to investigate the effect of these characteristics on teachers knowledge. This give FLEPS administrators the opportunity to find what are these differences and how do they effect on teachers self-efficacy in case of WPCK.

In conclusion, this study can be really helpful to FLEPS administrators to make their work easer with a clear understanding of what action they need to take in order to fulfill the integration of Web-based technology in their instruction.

1.4 Aims of This Study

This study conducted a survey to examin the level of teachers' self efficacy based on 5 factors of TPCK-W framework developed by Lee and Tsai (2010). The aim was to find a better preception of the level of teachers' knowledge in Web-technology which will help to know the areas which teachers need to improve their skills in order to

increase their level of sel-eficacy in using Web-technology in thir curreculum. In this regard, this study answered the following research questions:

- What is the level of self-efficacy of teachers in terms of their TPCK-W?
- Is there any relationship between the years of teaching experience of the teachers and applying TPCK-W by them?
- Is there any significant difference between the adoption of TPCK-W in teaching curriculum and teachers' age?
- Is there any significant difference between the adoption of TPCK-W in teaching curriculum and teachers' gender?
- Is there any significant effect by having or not having access to intent outside university?
- Is there any significant difference between teachers in different department of teaching in case of self-efficacy of WPCK?

1.5 Limitations

Since participants of this study were English course teachers there were some limitations which were as follows:

- there is a limitation in numbers of English teachers in Eastern Mediterranean University
- More than two third of participants which is 115 out of 167 were not participated in this study. So the scale of this survey might not be sufficient enough.
- Also, the survey was done anonymously, there was a likelihood that they did not mark the true level of their knowledge.

Chapter 2

LITERATURE REVIEW

Over the last decades, the influence of technology in education led scholars to study the ways of adopting and integrating new technologies in education. The main goal is to find an efficient way to provide teachers with enough self-efficacy to be able to integrate these new technologies (Tondeur et al., 2012). In addition, this study has provided a background studies in the area of one of the most influencing framework in education which called Technological Pedagogical Content Knowledge (TPCK-W) or as it pronounced in the recent studies Web Pedagogical Content Knowledge (WPCK).

2.1 Development of Technological Pedagogical Content Knowledge

The framework which is called WPCK was mainly developed based on three main studies. The first study was implemented by Shulman (1986) which was also the basic development of this framework. This was called Pedagogical Content Knowledge (PCK). After that, this framework was adopted and developed by Mishra and Koehler (2006) and it was called Technological Pedagogical Content Knowledge (TPCK). This framework was adopted and developed later by the study of Lee and Tsai (2010) to what they called Technological Pedagogical Content Knowledge (TPCK-W).

2.1.1 Pedagogical Content Knowledge

The first idea of the TPCK-W was proposed by Shulman's work in 1986. According to Shulman (1986), teachers need to have competency in teaching. Shulman claimed that the idea of examining teachers' capability in subject matter and pedagogical skill

is not something new rather it can trace back to century ago. The same pattern of those previous ideas was followed by Shulman (1986) in order to find an efficient way to assess these two areas. This assessment more emphasized on content and knowledge that teachers need to have. Furthermore, it was argued that in 1980s teachers' assessment was about some basic skills such as writing rather than content or subject matter.

Shulman (1986) pointed to the psychology as an essential need for teachers in order to identify and understand their students' biological function. Therefore, in the recent assessments there was more focus on teachers' behavior as an approach that increase teachers' effectiveness and can promote learners' level of learning. In Shulman's (1986) study, it was claimed that there was always a keen distinction between pedagogy and content. Actually, it is said that, it is impossible to separate them, as some believe that content is important and there is no need to emphasis on pedagogy and some inverse. Furthermore, teachers need to have particular knowledge and abilities in finding and choosing suitable content in order to not to waste the time and pedagogy as the method of choosing suitable activities and practices for students to attain the suitable goals. Shulman (1986) conducted his research intending to define a new explanation of the knowledge that is necessary in teaching process. In this regard, some questions were asked to support that idea. These questions were: what are the teachers' sources of knowledge? How much he\she knows? In what way he\she get his\her new knowledge? The focus of this study was investigating the secondary teachers in English, biology, mathematics, and social studies who all had bachelor's degree in the subject matter. As the results were shown, a relevant framework was needed which was combination of content knowledge and pedagogical knowledge.

This framework was named Pedagogical Content Knowledge (PCK). The component of this framework was explained as, Content Knowledge (CK), being an important element that teachers require to perceive the reason that the particular given topic is chosen as a subject matter to be taught, and Pedagogical Knowledge (PK), as a part of content knowledge which is related to its teaching perspective. Furthermore, it was mentioned that Pedagogical Content Knowledge can give a perception of what can make learning process more easy or hard.

2.1.2 Technological Pedagogical Content Knowledge

After that Shulman (1986) developed PCK, technology started to grow up rapidly and it began to be used and to influence in the education. Therefore, Mishra and Koehler (2006) came with an idea of developing new framework based on Shulman's (1986) work which was named Technological Pedagogical Content Knowledge (TPCK). Later on Koehler and Mishra (2009) called this framework TPACK. Mishra and Koehler (2006) claimed that the aim was to catch some necessary competencies which teachers need to have to integrate technology in teaching procedure. It was discussed that mindful use of technology in education need an elaborate and located kind of knowledge. The goal was more than a logical manner of perception about integrating technology in instruction. In fact, finding a connection among the technology and teaching was intended which can bring the teachers' conception and practice of training, education, and professional development. It was claimed that the framework contains work of several other investigations such as recent reforms and improvements in education which all of those studies stress on teacher's competency development (e.g. Zhao, 2003; U.S. Congress Office of Technology Assessment, 1995; International Society for Technology in Education, 2000; National Council for Accreditation of Teacher Education, 1997; U.S. Department of Education, 2000). It

was mentioned that the reason which technology was not considered in all those past studies is technology was not expanded as much as it is now. Furthermore, technology in education was referred to not as something like chalkboard or textbook, rather some new electronic technologies which work through software and hardware such as video games, computers, and the Internet-based software with educational purpose.

Moreover, Mishra and Koehler (2006) mentioned a significant problem of integrating technology in education. They noticed that there were lots of teachers who did not want to use these new technologies in their curriculum because of its complexity and also, teachers needed to have additional knowledge about those technologies in order to implement them in their classroom environment. They needed to spend lots of time gaining the necessary skills to be qualified and having the competence to use them as a learning material. In addition, in the line with what Shulman (1986) defined, Mishra and Koehler claimed that pedagogical knowledge is something apart from content knowledge. It was argued that technology is a separate knowledge that should be learned. It was revealed, that technological knowledge has to be blended with pedagogical knowledge and content knowledge because it can affect other two components of knowledge when decisions are made for instruction, pedagogy, and content to be taught. So any actions should consider all components of the framework which they have involved in interaction with each other as TPCK. In order to define PCK framework, Shulman's (1986) work was referred to as it defined all the components separately and together as a framework.

2.1.3 Technological Pedagogical Content Knowledge-Web

After the new technology called World Wide Web (WWW) was progressed and influenced in technology, TPCK framework was developed by Lee and Tsai (2010) to

what they called Technological Pedagogical Content Knowledge-W (TPCK-W). Lee and Tsai (2010) referred to previous studies in educational technology and claimed that due to the potential of Web technology in bringing online pedagogy in teaching it is necessary for teachers to know how to adopt and integrate Web technology into their curriculum. Additionally, it was argued that the purpose of this study was to develop new questionnaire which can help to analyze the perception of teachers' self-efficacy in terms of TPCK-W framework. This study emphasized on Web as a technology as well as teachers' attitude toward Web-based instruction. For this purpose, 558 K12 teachers in Taiwan participated to the research, and the teachers' self-efficacy in using Web pedagogy, their attitude in adopting Web-based instruction, as well as their background in using web technology was researched. The results indicated that there was a relationship between positive tendencies of applying web technologies in instruction and level of self-efficacy of the participants. In addition, it was found that teachers with more experienced in teaching and those who are older had lower level of self-efficacy with regards of Web-based instruction. On the other hand, those teachers with a rich background of applying web technology especially in instruction showed more level of self-efficacy in this area.

2.2 Related Studies

A similar research to the current research was conducted by (Kavanoz, Yüksel & Oscan, 2014). The pre-service teachers' understanding of self-efficacy with respect to Web Pedagogical Content Knowledge was investigated through the using English as a foreign language (EFL). The investigation was conducted in a Turkish state university with 113 EFL teachers. The research revealed that the participants had high level of WPCK self-efficacy. It was mentioned that the self-efficacy of pre-service teachers and Web-based instruction interact with each other. Moreover, it was noticed

that, the ones with more knowledge of Web-based instruction had more self-efficacy in perception of WPCK and the ones with less knowledge had problems in understanding self-efficacy of this framework. The findings showed no remarkable difference in gender or age. In conclution, it was argued that the age and gender did not effect on their perception level of WPCK.

In another other case, Pringle, Dawson and Ritzhaupt (2015) studied the manner which could help to engage science teachers into integration of technology in self-motivation designed instruction to apply Technological Pedagogical Content Knowledge, and content drillings in inquiry-based science lessons. The participants of this study were assigned to provide an efficient science lesson plan with integration of technology and submit it both at the beginning of the initiative and at the end. As a result, the authors reported that a total number of 525 lesson plans were submitted which 306 sent in pre-lesson and 219 sent post-lesson. The findings showed that there was an increase in application of technology in practices containing utilization of complex hardware. Other findings of this research indicated that the participants focused more on technology integration and utilization rather than its pedagogy and content. In conclusion, it was reported that, some schools may spend lots of money in providing new technologies instead of focusing on providing teachers with enough self-efficacy of using new technologies.

Another research used TPACK as a tool to assists pre-service English teachers as a foreign language teachers implemented in Turkey by (Öz, 2015). The total number of 76 undergraduate students was examined by this study who enrolled in English Language Teaching (ELT) program. The participants were asked to answer the 7 scale of TPCK. The participants were given some open-ended questions to respond. The

outcomes showed that TPACK level of their participants was mainly high. Furthermore, some significant differences in gender werefound. The findings also showed that the females had more level of perception in TCAPK than male. In the results of the qualitative survey of this study it was found that TPCK was used by faculty members more than of what cooperating teachers used in their curriculum. In conclusion, the finding determined that the utilization of TPACK in training the EFL pre-service teachers will provide them with the rich skills and knowledge which they need to be able to effectively integrate technology in their teaching curriculum.

Furthermore, Deng, Chai, So, Qian and Chen (2017) conducted an investigation which tended to validate other principles of Technological Pedagogical Content Knowledge structure certainly in content areas which there were lack of studies. The principles were predictive, discriminant, factorial, and convergent as well asconcepts of TPCK and teacher education were argued. For this purpose, a measurement for integration of TPCK with lesson plan was defined to realize how they are connected to epistemological beliefs about chemistry. This study was conducted in South China Normal University where 280 Chinese pre-service teachers from faculty of chemistry participated to the research. The results demonstrated that, those validity principles which wereexamined were acceptably specified. It also was discussed that as the participant's score of the seven scale of TPCK survey were medium and adequate, they indicated that the survey was implemented at the beginning of their TPCK course.It was mentioned that, after the participants completed this course, participants were able to design ICT lessons in some levels but, still needed to improve their knowledge to have enough self-efficacy of integrating technology in their lesson plans.

In addition to that Aydin, Eroğlu and Horzum (2017) studied the level of self-efficacy of WPCK framework of teaching English and Turkish language among the faculty of education at Sakarya University in Turkey. For this purpose, authors conducted a research which involved 263 students studying in departments of Turkish language teaching and English language teaching at Sakarya University. The participants consisted of 196 female and 67 male students of which 103 of them were from department of English Language Teaching and 160 of them were from department of Turkish Language Teaching.The participants were students of various grades consisting of 63 students were 1st grade, 87 were 2nd grade, 65 were 3rd grade, and 48 were 4th grade. For the implementation of this survey a demographic form together with the WPCK factors were prepared as a data collection tools. Thus, a strong connection between self-efficacy of web knowledge and tendency of using web tools in instruction and using English language wasfound. The results also illustrated that only 11.8 million outcomes found when they searched the word "oakum" using google as an online search engine, in case that 1,490 million outcomes were found as an outcome of searching the word "reading." this study concluded that, mastery in English language is crucial for using technology. It was also argued that because technology is growing there is an essential need to learn English language as a basic principle to learn the technology. This indicated that self-efficacy of Turkish language teaching was less than those who are from English language teaching.

2.3 Summary

This chapter illustrated the brief information and the background of development of Technological Pedagogical Content Knowledge-Web based on the studies which were implemented on this framework (Shulman, 1986; Mishra and Koehler, 2006; Lee and Tsai, 2010) and also some related studies which conducted in the area of using Web

technology in education (Kavanoz, Yüksel & Oscan, 2014; Pringle, Dawson & Ritzhaupt, 2015; Öz, 2015; Deng, Chai, So, Qian & Chen, 2017; Aydin, Eroğlu & Horzum, 2017).

The next chapter explains the methodology including the method was used to conduct the survey, the participants of this study (who and how many they are), the data collection tool (questionnaire), data analysis (e.g. statistical software), and validity & reliability of this survey (what is the origin of this survey and why the result is reliable).

Chapter 3

METHODOLOGY

Since any study needs designing, execution and analyses there is need to know the manner of designing and doing these procedures. In this regard, this chapter explains all the details about the method, participants, data collection tools, and analysis which used in this study.

3.1 Research Design

This study used quantitative approach with the utilization of survey to determine the level of language teachers' self-efficacy regarding Technological Pedagogical Content Knowledge (TPCK-W) framework at Eastern Mediterranean University, Foreign Languages and English Preparatory School.

Quantitative method of research is a remarkable method to explore and answer specified numerical questions (e.g. how much, how many, what, when, and where) with very top level of accuracy. The data analysis in this method is done by the use of certain statistical techniques. Moreover, this method is being used in some different categories (e.g. correlation research, experimental research, and survey research). Survey is a kind of research which evaluates a certain target papulation's attributes with the usage of a questionnaire which includes statistical answer to the given questions (Muijs, 2004).

3.2 Participants

The research was conducted with full time language teachers (N=167) at the Eastern Mediterranean University (EMU) Foreign Languages and English Preparatory School (FLEPS) in 2019. All participants were given informed consent form (Appendix C) prior to the research and their written consent was obtained prior to completing the surveys. Teachers' participation in this research was in voluntary basis, thus their refusal to participate in this research did not affect their relationship with the school in anyway. After all the target participants wereasked to participate in this survey, only 52 teachers have accepted to participate.

3.3 Data Collection Tools

This research used the questionnaire developed by Lee and Tsai (2010) (see Appendix A) which consists of five sections (web-general, web-communicative, web-content knowledge, web-pedagogical-content knowledge, and attitude toward web-based instruction). In addition, a form which included demographic questions (gender, age range, division of teaching, access to internet outside campus and years of experience in teaching) Appendix B, have provided for this study.

3.3.1 The Procedure Regarding to Adoption of TPCK-W Survey

All official permissions gathered based on the following stages: At first a permission letter was sent to ethics committee including a form which has all the information about the study (e.g. the title, the participants, method,). After the ethics committee approval another permission letter together with a copy of the Appendix A, B, and the teachers consent form Appendix C, was sent to the head of FLEPS in order to implement the study. Thus, all official approvals were taken based on the eastern Mediterranean University standards prior to the research.

3.4 Data Analysis

The data analysis tool which used in this study was STATA software version 14. The data analyzed through regression technique to find any significant relationships between the all the factors of Technological Pedagogical Content Knowledge-Web framework Appendix A, and the characteristics of the independent variables of this study Appendix B. This technique is a very efficient and accurate statistical analysis technique which is able to explain the relationship between these variables and the way that they effect on each other.

Multiplex indicators were computed for these variables in equations 1-5 in order to aggregate information collected on each one. As a result an index value was produced for each of these 5 factors of TPCK-W.

$$\text{WGI} = \left(\sum_{i=1}^{n} yi\right) / \left(\sum_{i=1}^{n} Yi\right) \text{x } 100 \quad (1)$$

$$\text{WCI} = \left(\sum_{i=1}^{n} yi\right) / \left(\sum_{i=1}^{n} Yi\right) \text{x } 100 \quad (2)$$

$$\text{WCKI} = \left(\sum_{i=1}^{n} yi\right) / \left(\sum_{i=1}^{n} Yi\right) \text{x } 100 \quad (3)$$

$$\text{WPCKI} = \left(\sum_{i=1}^{n} yi\right) / \left(\sum_{i=1}^{n} Yi\right) \text{x } 100 \quad (4)$$

$$\text{ATTI} = \left(\sum_{i=1}^{n} yi\right) / \left(\sum_{i=1}^{n} Yi\right) \text{x } 100 \quad (5)$$

Where;

n = number of variables being scaled under,

y_i = actual score by a respondent on *i*th variable,

And Yi = maximum possible score that *i* could have on the scale used.

Moreover, the following econometric models were formulated to examine the impact of the independent variables such as age-range, years of teaching experience, gender,

attitude toward web-based instruction, division, and Internet access outside school on 4 factors of TPCK-W such as Web-communicative, Web-communicative, Web Content Knowledge, and Web Pedagogical Content knowledge. The results indicated the coefficient value of the variables.

$$WGI = \beta o + \beta_1 age_i + \beta_2 experience_i + \beta_3 gender_i + \beta_4 attitude_i + \beta_5 division_i + \beta_6 internet_i + \varepsilon_i \quad (1)$$

$$WCI = \beta o + \beta_1 age_i + \beta_2 experience_i + \beta 3 gender_i + \beta 4 attitude_i + \beta_5 division_i + \beta_6 internet_i + \varepsilon_i \quad (2)$$

$$WCKI = \beta o + \beta_1 age_i + \beta_2 experience_i + \beta 3 gender_i + \beta_4 attitude_i + \beta 5 division_i + \beta 6 internet_i + \varepsilon_i \quad (3)$$

$$WPCKI = \beta o + \beta_1 age_i + \beta_2 experience_i + \beta 3 gender_i + \beta_4 attitude_i + \beta 5 division_i + \beta 6 internet_i + \varepsilon_i \quad (4)$$

βj = parameters (j = 1, 2, 3…,6)

ε = error term

The measures of web pedagogical content knowledge that serve as the dependent variables are given as follows:

- Web-General (WG): examining teachers' proficiency in general knowledge of web tools and its application, e.g., I can download pictures from the website.
- Web-Communicative (WC): assessing teachers' level of trust in their knowledge about communication or interaction through utilization of Web-based tools, e.g., ability to talk to others one on one in an online chatroom.
- Web-Content Knowledge (WCK): surveying teachers' measure of knowledge in a fashion which Web technology and content knowledge integrate to empower each other, e.g., ability of using Web technology to enhance teaching.

- Web-Pedagogical Content Knowledge (WPCK): examining teachers' measure of believe in their knowledge in finding suitable online learning activities and practices in order to meet their goals in certain course. In addition, to provide proper pedagogy with regard to online activities, e.g., I can guide students to use Web resources to study a certain course unit.

The independent variables for each of the regression equations are as follows:

- Age: This element represent the age range of the participants which are divided into five age groups. First group ranged from 21 to 25, second group ranged from 26 to 30, third group ranged from 31 to 40, fourth group ranged from 41 to 45, and fifth group ranged more than 46 years old.
- Experience: This factor represent the years of teachers' experience in teaching which divided into four groups. Group one illustrated less than one year, group two illustrated the range between 2 to 5 years, group three illustrated the range between 6 to 10 years, and group four indicated the range more than 11 years of experience in teaching.
- Gender: This referred to the gender of the respondents such that female respondents took the value of zero and male respondents took the value of 1.
- Attitude toward Web-based instruction (Attitudes): Examining the level of teachers' satisfaction with respect to using web-based tools in instruction, e.g., Web technology can enhance teaching skills.
- Division: This component indicated the division where the teachers were teaching and it consisted of two different departments. First department was Foreign Languages Division and second one was English Preparatory School.

- Internet: This element determines whether the teachers had access to the Internet outside the university or not with two options, first one was (Yes), and the second one was (No).

3.5 Validity and Reliability

According to Muijs (2004) validity and reliability are two significant components of measurement in quantitative research method because all qualitative method is about measuring some variables. There are two important factors which should be considered by all studies:

- The study was not measured the wrong thing (e.g., height instead of weight). This shows that the data is validate or in the other words, it represents the validity of the research.
- The scale which is chosen is not entirely erratic (e.g., provide a different measure each time is being used). This indicates whether the scale is reliable or not. In the other terms this represent the reliability of the research.

3.5.1 Validity

The factors which used by this study were found highly reliable by Lee and Tsai (2010). The Cronbach's alpha of their study were found 0.94 for Web-general, 0.96 for Web-communicative, 0.94 for Web Content Knowledge, 0.95 for Web Pedagogical Content Knowledge, and 0.92 for Attitude toward Web-based instruction of TPCK-W respectively. Moreover, the total alpha found in their study was 0.96 which indicates high reliability of the factors which prove the validity of this study.

3.5.2 Reliability

Table 1. The Reliability Test for TPCK-W

Item	Alpha
Web-general	0.98
Web-communicative	0.87
Web Content Knowledge	0.99
Web Pedagogical Content Knowledge	0.95
Attitude toward Web-based instruction	0.96

The table 2 above illustrates high reliability scale of the result of this study in all 5 factors of the technological pedagogical content knowledge-web (TPCK-W) questionnaire which is developed by Lee and Tsai (2010) and adopted by this study. The reliability (alpha) measures found in this study were 0.98 for Web-general, 0.87 for Web-communicative, 0.99 for Web Content Knowledge, 0.95 for Web Pedagogical Content Knowledge, and 0.96 for Attitude toward Web-based instruction respectively. In addition the high overall reliability scale of 0.94 wasfound which emphasis the findings of this study are quite reliable.

Chapter 4

FINDINGS AND RESULTS

This chapter reported all the resulted data which produced through the data analysis which mentioned in previous chapter (chapter 3). In addition, all the resulted data for the tables in this chapter were discussed and explained in the bellow of each tables in order to give a better perception of the findings of this study.

4.1 Descriptive Mines and Standard Deviation of 5 Factors of TPCK-W

The tables bellow illustrated the results of both appendix A and B in detail. Also the comparison and the relationship between each factor of Appendix A and B in order to find if there are any significant relationships between those factors of demographic questions (age, gender etc.) and TPCK-W.

Table 2. Descriptive Mines and Standard Deviation of 5 Factors of TPCK-**W**

factor	No of items	Mean	S.D
Web general	7	0.809	0.281
Web-communicative	4	0.764	0.221
Web Content Knowledge	5	0.802	0.287
Web Pedagogical Content Knowledge	8	0.757	0.194
Attitude toward Web-based instruction	6	0.757	0.194

N=52

The table 2 above expressed the average knowledge of all participants in each factor of technological pedagogical content knowledge-web (TPCK-W). The mean scales of the table above indicated almost high average knowledge in all factors (as all of them are close to 1) with the highest mean in Web-general (0.809) which showed that participants had high general knowledge in web technology. The mean value of other factors of TPCK-W were found 0.764 for Web-communicative, 0.802 for Web content Knowledge, 0.757 for Web Pedagogical Content Knowledge, and 0.757 for Attitude toward Web-based instruction respectively. Moreover, standard deviation scales of this table resulted quite centralized distribution of knowledge for each factor as all of them were close to zero with values of 0.281 for Web-general, 0.221 for Web-communicative, 0.287 for Web content Knowledge, 0.194 for Web Pedagogical Content Knowledge, and 0.194 for Attitude toward Web-based instruction. Other findings showed high average mean in attitude toward Web-based instruction which means that all participants had very positive attitude in using and integrating Web technology and the pedagogy of it in their instruction.

4.2 Web General

The table 3 bellow demonstrated the relationships between all the independent variables of this study and the dependent variable of Web-general.

Table 3. Web General

Item	Coefficients	Standard error	t-statistic	P-value
Gender	0.004	0.049	0.08	0.933
Age-range	-0.005	0.025	-0.21	0.836
Division	-0.022	0.040	-0.56	0.577
Internet access outside school	0.025	0.040	0.63	0.532
Years of experience in teaching	0.061	0.033	1.85	0.071
Attitude toward Web-based instruction	0.977	0.087	11.23	0.000
R^2	0.771			
F stat	27.52			
F (P-value)	0.000			

N=52

The table 3 above demonstrated a significant relationship between the general knowledge of web and the years of experience in teaching with the P-value of 0.071 (P<0.1).Since the coefficient number of this factor was positive (0.061), it indicated that the teachers who were belong to more experienced groups had more knowledge than the other groups. This means the more experience teachers had in teaching, more knowledge they had in Web-general. Furthermore, a remarkable relationship was found in attitude toward Web-based instruction factor with the P-value of 0.00 (P<0.01). The coefficient number of this factor was a positive value of 0.977 which determined that, teachers who had positive attitude in Web-based instruction also had more knowledge in web-general. Other P-value measures of this table were 0.933 for Gender, 0.836 for Age-range, 0.577 for Division, and 0.532 for Internet access outside school which all of them were P>0.1 and not significant.

In addition, the R^2 value of this table (0.771) showed that this specified model was able to explain 77.1% of the entire variation in Web-general and F statistic of overall (F (P-value 0.000 P<0.01)) which showed the whole model was significant.

4.3 Web Communicative

The table 4 bellow demonstrated the relationships between all the independent variables of this study and the dependent variable of Web-communicative.

Table 4. Web Communicative

Item	Coefficients	Standard error	t-statistic	P-value
Gender	-0.059	0.078	-0.75	0.457
Age-range	0.025	0.051	0.48	0.630
Division	-0.079	0.050	-1.57	0.124
Internet access outside school	-0.214	0.049	-4.30	0.000
Years of experience in teaching	-0.033	0.079	-0.43	0.672
Attitude toward Web-based instruction	0.500	0.113	4.39	0.000
R^2	0.355			
F stat	8.96			
F (P-value)	0.000			

N=52

The table 4 above resulted that there was a significant relationship between knowledge of web-communicative and internet access outside school with the P-value of 0.000 (P<0.01). As The coefficient value of this factor was negative (-0.214), it illustrated that the teachers who chose the first option (Yes) had more self-efficacy of Web-communicative factors. This means those teachers who had access to the internet

anywhere, any time; had more self-efficacy in communication through web applications and online chatrooms. In addition, another significant relationship was found in the Attitude toward Web-based instruction factor with the P-value of 0.00 ($P<0.01$). The coefficient number of this factor was a positive value of 0.500 which showed that teachers with positive attitude toward web-based instruction had more self-efficacy in using online communication tools. Other P-value measures of this table were 0.457 for Gender, 0.630 for Age-range, 0.124 for Division, and 0.672 for Years of experience in teaching which all of them were $P>0.1$ and not significant.

Furthermore, the R^2 value of this table (0.355) determined that the certain model is capable of explaining the 35% of all variation in Web-communicative and F statistic of overall (F (P-value 0.000 $P<0.01$)) which showed the whole model was significant.

4.4 Web Content Knowledge

The table 5 bellow demonstrated the relationships between all the independent variables of this study and the dependent variable of Web content Knowledge.

Table 5. Web Content Knowledge

Item	Coefficients	Standard error	t-statistic	P-value
Gender	0.004	0.050	0.08	0.933
Age-range	0.022	0.020	1.08	0.285
Division	-0.017	0.037	-0.46	0.646
Internet access outside school	0.027	0.058	0.47	0.643
Years of experience in teaching	0.052	0.038	1.35	0.185
Attitude toward Web-based instruction	1.059	0.079	13.36	0.000
R^2	0.823			
F stat	32.1			
F (P-value)	0.000			

N=52

The table 5 above indicated a significant relationship between teachers' attitude toward Web-based instruction and Web Content Knowledge with the P-value of 0.000 (P<0.01).As the coefficient number of this element was positive value of 1.059, it indicated that all the participants had a positive attitude toward Web-based instruction in relationship with Web Content Knowledge. Other P-value measures of this table were 0.933 for Gender, 0.285 for Age-range, 0.646 for Division, 0.643 for Internet access outside school, and 0.185 for Years of experience in teaching which all of them were P>0.1 and not significant.

The R^2 value of this table (0.823) indicated the notable explanation (82.3%) of this model of equation for Web-communicative factors and F statistic of overall (F (P-value 0.000 p<0.01)) which showed the whole model was significant.

4.5 Web Pedagogical Content Knowledge

The table 6 bellow demonstrated the relationships between all the independent variables of this study and the dependent variable of Web Pedagogical content Knowledge.

Table 6. Web Pedagogical Content Knowledge

Item	Coefficients	Standard error	t-statistic	P-value
Gender	-0.051	0.044	-1.16	0.253
Age-range	-0.052	0.028	-1.89	0.065
Division	-.0.080	0.039	-2.05	0.047
Internet access outside school	-0.034	0.071	-0.48	0.635
Years of experience in teaching	-0.047	0.066	-0.71	0.480
Attitude toward Web-based instruction	0.501	0.0814	6.15	0.000
R^2	0.591			
F stat	10.68			
F (P-value)	0.000			

N=52

Table 7 above determined a significant relationship between the age-range and Web Pedagogical Content Knowledge at the P-value of 0.065 (P<0.1). As coefficient number of this factor (-0.052) was very close to zero, it indicated that the youngest age-range (group 1) had more self-efficacy of WPCK than the all other age-ranges (group 2, 3, 4, and 5). In the other words, as much as the teachers were younger, they had more self-efficacy of Web Pedagogical Content Knowledge. Moreover, another significant was seen in the division factor with the P-value of 0.047 (P<0.05). As the

coefficient number of this element was negative value (-0.080), It determined that the teachers of Foreign languages (group 1), had more self-efficacy in WPCK than the teachers of English preparatory school (group 2). In addition, another significant was found in the attitude toward Web-based instruction with the P-value of 0.000 (P<0.01). Since the coefficient value of this element was positive (0.501), it indicated that teachers had positive attitude toward Web-based instruction in case of WPCK. Other P-value measures of this table were 0.253 for Gender, 0.635 for Internet access outside school, and 0.480 for Years of experience in teaching which all of them were P>0.1 and not significant.

Moreover, The R^2 scale of the table (0.591) above indicated that this certain model of equation was able to define 59.1% of entire variations in Web Pedagogical Content Knowledge and F statistic of overall (F (P-value 0.000 P<0.01)) determined that the whole model was significant.

4.6 Summary of Findings and Results

In conclusion, the findings of this study illustrated some significant relationships between the independent variables and dependent variables in each of the tables (3, 4, 5, and 6) above. Those significant relationship showed that the demographic characteristics of the participants play very important role in some factors of Web Pedagogical Content Knowledge which can effect on the level of perception and the knowledge of WPCK framework. The result showed that, the teachers of FLEPS had all tend to use WPCK principles as an interesting manner of teaching as they declared a positive attitude toward web-based instruction in all 4 factors of TPCK-W framework which examined in this study including Web-general, Web-communicative, Web Content Knowledge, and Web Pedagogical Content Knowledge.

Chapter 5

DISCUSSION AND CONCLUSION

This study investigated the knowledge level of teachers in 24 items in 4 different areas of Web pedagogical content knowledge through adopting Technological Pedagogical Content Knowledge-Web (TPCK-W) which was developed by (Lee & Tsai, 2010). This survey included 7 items of Web-general which consisted of the general knowledge of Web technology e.g., I can use the Web search engines, 4 items of Web communicative e.g., I can read others' message in a chatroom, 5 items of Web Content Knowledge e.g., I know how to select proper content from Web resources, and 8 items of Web Pedagogical Content Knowledge e.g., I can apply Web technology to use multiple teaching strategies on particular course unit. All these factors indicated the scale of teachers' knowledge in Web technology related to education, the certain pedagogy which is needed to be taken (the manner of adopting and integrating Web technology in teaching), and the content which they need to choose and integrate in their teaching (subject matter). The combination of these three factors formed Technological Pedagogical Content Knowledge-Web (TPCK-W) framework which developed by (Lee & Tsai, 2010). This framework was developed based on original work of Shulman (1986) Pedagogical Content Knowledge (PCK) and the later development of Mishra Koehler (2006) Technological Pedagogical Content Knowledge (TPCK). In addition to those, 6 different items of Attitude toward Web-based instruction were examined teachers' attitude toward Web-based instruction e.g., Web technology can enhance teaching skills. A demographic form was also developed

by this study aimed to investigate the characteristics of participants such as age-range, Gender, years of experience in teaching, division of teaching, and access to the internet outside school.

As a result of this study, some significant relationships were found between the items of the demographic form and the level of knowledge of the participants in items of the TPCK-W framework. For the Web-general a significant relationship was found in two independent variables which were years of experience in teaching with the P-value of 0.071 ($P<0.1$) and attitude toward Web-based instruction with the P-value of 0.000 ($P<0.01$). The result of the experience in teaching indicated that unlike the findings of the same factor in Lee and Tsai (2010) which showed that the teachers with more experience in teaching had less self-efficacy than the teachers with less experience, the participants of this study who had more experienced in teaching also had more self-efficacy. Furthermore, all the participants had positive attitudes toward Web-based instruction with respect to Web-general factors.

Another significant relationships were found in two independent variables of Web-communicative including the internet access outside school with the P-value of 0.000 (0.01) and attitude toward Web-based instruction with the P-value of 0.000 (0.01).These significant measures of this factor indicated that the ones who had internet access outside school had more knowledge in communication through Web applications. In addition, all teachers expressed positive attitude toward Web-based instruction based on items of Web-communicative.

Moreover, for the Web-content knowledge there was only one significant relationship in attitude toward Web-based instruction with the P-value of 0.000 ($P<0.01$).The result

of this factor indicated the likelihood of complexity in perceiving the Web content knowledge whereas, they had positive attitude toward using Web Content Knowledge in teaching.

For the Web Pedagogical Content Knowledge a significant relationship was found for the variables of age-range with the P-value of 0.065 ($p< 0.1$), division of teaching with the P-value of 0.047 ($P<0.05$), and attitude toward Web-based instruction with the P-value of 0.000 ($p<0.01$). These measures indicated that as much as teachers were younger their level of knowledge in pedagogy and the content which was needed to integrate Web-technology into their instruction had risen which is in line with the findings of (Lee & Tsai, 2005). It is also found that, teachers at Foreign Languages Division had more knowledge in this area than the teachers from English preparatory school. In addition, the participants showed positive attitude towards the using this framework in teaching.

On the other hand, the R^2 results of the tables 3, 4, 5, and 6 indicated that this certain model of equation was good enough to explain those factors of the TPCK-W. Also the F (P-value) results showed that this entire model was quite significant ($P<0.01$).

Other findings of this study indicated that all participants had high level of knowledge in all 4 factors of WPCK. This finding was similar to the findings of Yeşiltaş (2016) which its participants also illustrated grate level of perception in the area of WPCK.

Furthermore, the most interesting and important finding of this study was the result of attitude toward Web-based instruction. As it was shown in the tables 3, 4, 5, and 6 the result of its items in all these tables were significant ($P<0.01$) which means the

participants had positive attitude toward Web-based instruction in terms of items of Web-general, Web-communicative, Web-content knowledge, and Web Pedagogical Content Knowledge which supported the findings of Lee and Tsai (2010) for this factor.

As the findings of this study indicated high level of participants' knowledge in WPCK, they also showed high level of positive attitude toward Web-based instruction. So this was considerable that the results of this factor supported the results of the study of Aydin, Eroğlu and Horzum (2017) as it also claimed that the participants which had positive attitude in all WPCK factors also had high level of self-efficacy of Web-based instruction.

In addition to those findings above, in line with Kavanoz, Yüksel, and Oscan (2014) no significant relationship wasfound between the 4 factors of TCPK-W and the participants gender. The P-value of these factors were found 0.933 for Web-general, 0.457 for Web-communicative, 0.933 for Web Content Knowledge, and 0.253 for Web Pedagogical Content Knowledge which were more than $P>0.1$ and not significant.

In conclusion, this study was conducted in line with Lee and Tsai (2010), Kavanoz, Yüksel and Özcan (2014), intending to find about one of the most challenging areas of today's education which is integrating technology in education. In fact, in the recent decades instructors and curriculum designers are concern about this issue and they are always struggling to find an efficient manner to do it. With this respect, this study adopted Technological Pedagogical Content Knowledge-Web (TPCK-W) questionnaire from Lee and Tsai (2010) as a useful and almost new interesting framework for integrating technology in education which can propose an effective

manner of teaching to increase the level of self-efficacy of teacher in adopting and integrating Web technology into education.

in addition, since this study examined the level of self-efficacy of teachers with respect to TPCK-W, the result can be a useful guidance for instructors and instruction designers of Eastern Mediterranean university and also in all over the world. They can use these findings to study and discover more about this framework and how it can be useful in designing the curriculum and what work need to be done to increase the level of Web technology between teachers (Öz, 2015).

5.1 Recommendations

I suggest that more studies are needed to implement in this specific area since technology has an important role in education and the future of it. Future studies should concentrate on adopting and developing new technologies in this particular framework (e.g. interactive whiteboards) as a technological tool for education. Because there are always new technologies which need to be studied in order to find an efficient way to integrate them in education. Moreover, if it is aimed to provide FLEPS teachers professional development in web pedagogical content knowledge, it is suggested to conduct this research again with more participants so that the administration has a better picture of what is needed because only one third of the teachers volunteered to participate this research.

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APPENDICES

Appendix A: TPCK-W Questionnaire Developed by Lee and Tsai (2010)

The following questions started bellow will be answered with the given 6 points Likert scale, with 6 specifying that you strongly agree (SA), 5 specifying that you agree (A), 4 specifying that you moderately agree (MA), 3 specifying that you moderately disagree (MD), 2 specifying that you disagree (D), 1 specifying that you strongly disagree (SD)

		SA	A	MA	MD	D	SD
Web-general		6	5	4	3	2	1
1	I can click the hyperlink to connect to another Website.						
2	I can key in the website address to connect to a particular Website.						
3	I can print out the content of a Website.						
4	I can search for information on the Web using keywords.						
5	I can download pictures from the Web.						
6	I can use the Web search engines.						
7	I can copy text on the Web into the "Word"						
Web-communicative		6	5	4	3	2	1
8	I can read others' messages in a chatroom.						
9	I can set a nickname by myself in an online chatroom.						
10	I can talk to others one on one in an online chatroom.						
11	I can provide information or respond to someone else on a BBS (Bulletin Board System).						
Web-Content Knowledge		6	5	4	3	2	1
12	I know that Web technology can provide various materials to enrich course content.						
13	I know how to search online resources for course content.						
14	I know how to select proper content from Web resources.						
15	I can search related online materials for course content.						
16	I can search for various materials on the Web to be integrated into course content.						

Web-Pedagogical-Content knowledge		6	5	4	3	2	1
17	I know how to apply teaching modules on the web into courses.						
18	I can use Web technology to enhance teaching.						
19	I can use the Web to enhance students' learning motivation.						
20	I can select proper existing Web-based courses to assist teaching.						
21	I can apply Web technology to use multiple teaching strategies on particular course unit.						
22	I can guide students to use Web resources to study a certain course unit.						
23	I can use Web resources to guide students' learning activities for a certain course unit.						
24	I can use Web technology to support teaching for the content of a particular course unit.						
Attitude toward Web-based instruction		6	5	4	3	2	1
25	Web technology can be actually used in the practice of teaching.						
26	The characteristics of the Web can help instruction.						
27	Web technology can enhance teaching skills.						
28	Web-related resources can enrich course content.						
29	Web-based teaching can enhance students' learning motivation.						
30	Web-based teaching is a future tend in education.						

Appendix B: Demographic Questions

To answer the questions in this section please put a tick in the appropriate box that best suits the answer can be selected for a question.

Note: only one answer can be selected for a question.

1. Gender :
   - ☐ Female
   - ☐ Male
2. Age range:
   - ☐ 21-25
   - ☐ 26-30
   - ☐ 31-40
   - ☐ 41-45
   - ☐ 46+
3. Which division are you teaching at?
   - ☐ Foreign languages
   - ☐ English Preparatory School
   - ☐ Other
4. Do you have access to internet connection outside the school?
   - ☐ Yes
   - ☐ No
5. The years of experience in teaching?
   - ☐ Less than 1 year
   - ☐ 2-5 years
   - ☐ 6-10 years
   - ☐ 11 years or more

Appendix C: Consent Form for Teacher Questionnaires

Dear teachers,
I am currently a masters' student in the Information Communication Technology in Education program in Department of Computer Education and Instructional Technology which at present undergoing my thesis on the examining teachers' self-efficacy regarding Pedagogical Content Knowledge-Web framework of the teachers in Eastern Mediterranean University.
The aim of this thesis survey is to find about your level of knowledge in Web technology and also determine your competency in adaptation of Web in course curriculum.

The aim of my thesis is as follows:
1. Perceived self-efficacy in terms of their TPCK-W
2. Attitudes regarding Web-based instruction, and
3. Participants background variables (i.e., age, years of teaching, Web experience, and experience of Web-related instruction).

Pedagogical Content Knowledge-Web can be defined as a framework that is combination of pedagogical knowledge (PK) of teaching something separate from subject matter rather as teacher's knowledge in managing and organizing the classroom. Also, content knowledge (CK) as knowledge is required teachers to have about the content of teaching with respect to their perception, imagination, and direction which organize the origin of their understanding of teaching the subjects.
The questionnaire consists of two parts and will take approximately 10 minutes of your time to answer all the questions. After reading the questions carefully, please tick the most appropriate box. The time allocated is for you to fill out this survey and honestly. You are free to withdraw from the study at any time. All data you have provided will be kept confidentially and will only be used for research. For further information or complaint, you can contact me or my thesis supervisor without any hesitation. If you voluntarily agree and give your consent in participating in this questionnaire survey, please fill and sign the appropriate fields below.

Thank you for your time and participation.

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I have read and understood this form. I have asked my necessary questions and received answers to my questions. I accept to participate in this survey voluntarily.

Name- Surname:

Date:

Signature: