

# An Analysis of Social Studies Teachers' Perception Levels Regarding Web Pedagogical Content Knowledge

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## Abstract

Web pedagogical content knowledge generally takes pedagogical knowledge, content knowledge, and Web knowledge as basis. It is a structure emerging through the interaction of these three components. Content knowledge refers to knowledge of subjects to be taught. Pedagogical knowledge involves knowledge of process, implementation, learning methods, and teaching methods. Web knowledge is about general Web competencies such as the use of tools related to the Web, Web-based communication, and Web-based interaction. The purpose of this study is to analyze social studies teachers' perception levels regarding Web pedagogical content knowledge. The population of the study covers social studies teachers in Turkey while the sample of the study covers 601 social studies teachers who were randomly selected from 75 cities of Turkey in 2015. Data collection tool employed in this study is Web Pedagogical Content Knowledge Scale composed of 30 items and five factors, developed by Lee, Tsai, and Chang (2008), and adapted to the Turkish language by Horzum (2011). Data analysis of the study was conducted via IBM SPSS Statistic 23 package. The findings were analyzed based on arithmetic mean, standard deviation, Mann-Whitney U test, and Kruskal-Wallis test. The significance of the data was evaluated at a significance level of 0.05. The results indicate that social studies teachers' perceptions regarding Web pedagogical content knowledge are high. The results also show that they consider themselves competent in this matter, and their perceptions regarding Web pedagogical content knowledge significantly vary by gender, the Department of graduation, and experience of using computers whereas they do not significantly differ by educational background and status of having a computer.

**Keywords:** social studies, social studies teachers, web pedagogical content knowledge, technological pedagogical content knowledge

## 1. Introduction

The rapid flow of information in current times accompanied by swiftly changing student profiles has made it compulsory to use computer technologies in education and thus in social studies education. While having a computer and using one was even considered a luxury two decades ago, now computers are in every house, even in every pocket in the form of mobile computers thanks to smartphone technology. The youth of the 21<sup>st</sup> century communicates to a great extent via computers and the Internet. Even the majority of primary school students use instant messaging applications (e.g. Whatsapp, Skype) and social networking sites (e.g. Facebook, Twitter, Orkut) (Yeşiltaş, 2011). According to EU Kids Online (2012) report, 59% of children aged 9-16 have social networking accounts. Again, the same report states that children aged 9-16 benefit from the Internet for school studies (85%), online games (83%), watching video clips (76%), and instant messaging (62%).

It is possible to assert that educational institutions are responsible for providing the society with individuals who are compatible with it, can use new technologies required by learning-teaching activities, and are capable of using them in accordance with the needs of society. Therefore, both the teachers working in schools affiliated with the Ministry of National Education and the academic members educating prospective teachers are under a big responsibility. One of the most important roles of educators is to integrate the content knowledge and pedagogical knowledge with developing technology in their educational activities by following the advancements closely (Önal & Çakır, 2015). This integration is also an obligation attributed to teachers due to changing student profiles.

International research also focuses on what should be known and done by a teacher. The competencies that

should be possessed by teachers are addressed in the literature under the name of Pedagogical Content Knowledge (PCK) (Timur & Taşar, 2011). Shulman (1986) analyzed types of content knowledge in three categories, which are “content knowledge”, “curricular knowledge”, and “pedagogical content knowledge”. As technology has rapidly become more common in education, Mishra and Koehler (2005) added the dimension of technology to pedagogical content knowledge, which resulted in Technological Pedagogical Content Knowledge (TPCK) model. This model, which is based on Shulman’s (1986) categorization, defines what kind of an interaction there is between technology, pedagogy, and content (Harris, Mishra, & Koehler, 2007). Mishra and Koehler explained technological pedagogical content knowledge through seven elements and the relationships between them (Figure 1). These are as follows:

- 1) Technology knowledge-TK
- 2) Content knowledge-CK
- 3) Pedagogical knowledge-PK
- 4) Pedagogical content knowledge-PCK
- 5) Technological content knowledge-TCK
- 6) Technological pedagogical knowledge-TPK
- 7) Technological pedagogical content knowledge-TPCK

(Harris, Mishra, & Koehler, 2009).

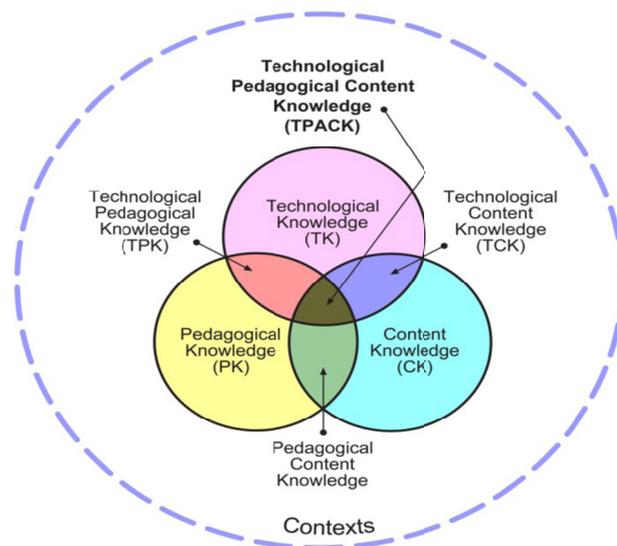


Figure 1. Technological Pedagogical Content Knowledge (TPACK) (Koehler & Mishra, 2009)

To Braun (1999), modern citizenship skills include ability to access information, ability to use information appropriate with aims, and the ability to analyze information that has an enormous range. These can be directly achieved through the use of computer and technology (Kaya, 2008). The use of technology in social studies has gained an ever more importance thanks to constructivist learning practices, which are used more and more (Dils, 1999). It is reported that technology and technological tools serve as efficient sources of motivation for students to learn in social studies classes (Bass, Rosenzweig, & Mason, 1999).

At the present time, Internet/Web technologies are among the most important technologies used by people. Even the number of users of social networks, which have a considerable share in the Internet/Web use, give an opinion about the importance and prevalence of these technologies. For example, the report published by Facebook (Facebook, 2015) shows that it has 1.5 billion active users. Considering that not every Internet user has a Facebook account, it can be said that the number of people benefiting from Internet/Web technologies is too big to be ignored. Additionally, Internet/Web is the leading and the most important technology employed by people currently. Their characteristics are different from other types of technologies. Moreover, they have an influence

on the use and prevalence of current technologies, and their use involves other technologies. Therefore, there is a need to construct content knowledge regarding the Internet and Web in a different way. In this regard, Lee and Tsai (2010) and Lee, Tsai, and Chang (2008) made a definition of Web technological pedagogical content knowledge (Horzum, 2011). Lee and Tsai (2010) stated that teachers do not adequately benefit from Web technologies during their training to be teachers and that using Web technologies more and more every passing day during their teaching period brings some opportunities and problems. For instance, proper integration of Web technologies into teaching activities is an important issue which requires training for teachers.

Web pedagogical content knowledge, just like other similar approaches, is based on the components of pedagogical knowledge, content knowledge, and Web knowledge. It is a structure resulting from the mutual interaction of these three components (Akgün, 2013). Content knowledge refers to the knowledge of the subject to be taught. Pedagogical knowledge involves knowledge of the process, practice, and learning and teaching methods. Web knowledge refers to general Web competencies such as the use of tools about Web, Web-based communication, and Web-based interaction (Gömleksiz & Fidan, 2011).

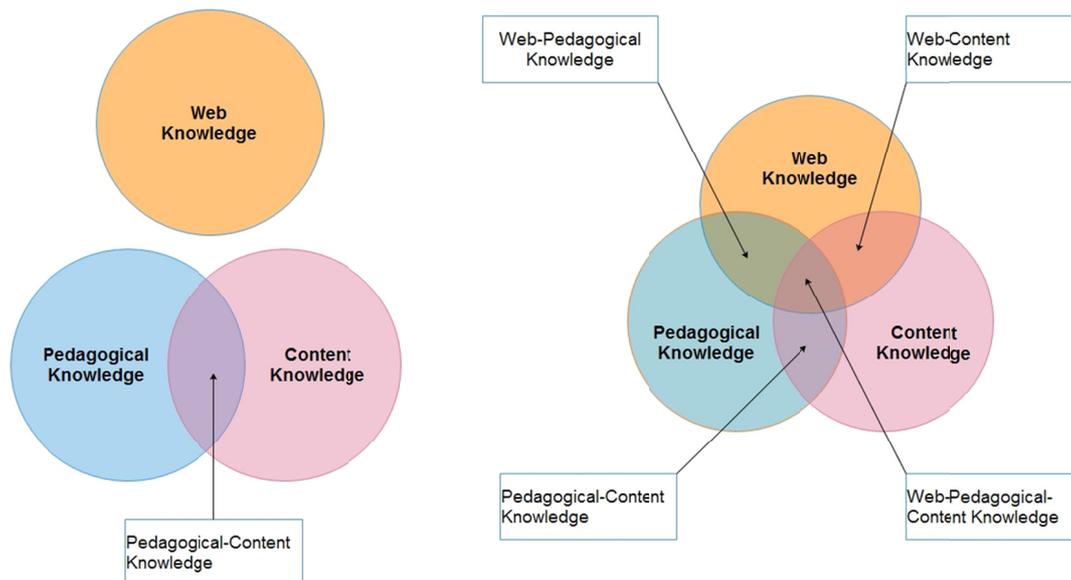


Figure 2. The Frame of Web Pedagogical Content Knowledge (WPCK) (Lee & Tsai, 2010)

Web pedagogical content knowledge, which is seen in Figure 2, is the product of the interaction of content knowledge, pedagogical content knowledge, and web content knowledge and has four principal components (Gömleksiz & Fidan, 2011). The brief explanations of these components are as follows:

- a. Pedagogical content knowledge-PCK: It is the pedagogy knowledge which can be applied to teach a specific content. It covers information about which teaching approach is appropriate for a content and how content should be organized to yield better learning (Arabacıoğlu & Dursun, 2015).
- b. Web pedagogical knowledge-WPK: It emphasizes teachers' use of Web, the components of Web, and Web skills in educational environments. In addition to a teacher's command of a set of Web tools (e.g. online discussions) for certain tasks, it refers to knowing which pedagogical strategies can be employed on Web to have the most efficient results (Lee, Tsai, & Chang, 2008; Lee & Tsai, 2010).
- c. Web content knowledge-WCK: This knowledge refers to combining a content with Web characteristics and advantages. In other words, it highlights teachers' capability of not only teaching the content but also integrating content with Web applications (Lee, Tsai, & Chang, 2008; Lee & Tsai, 2010).
- d. Web pedagogical content knowledge-WPCK: It involves knowledge of teaching the content and carrying out instruction by integrating Web characteristics and advantages into the content. It is pointed out that teachers' treatment of knowledge considering the interaction between Web, pedagogy, and content will yield important results to ensure teachers' professional development and education-Web integration (Lee, Tsai, & Chang, 2008; Lee & Tsai, 2010).

The Dimensions of Web Pedagogical Content Knowledge are as follows:

- Web-general: General command of Web.
- Web-communicative: Web-based communication or web-based interaction processes.
- Attitude toward web-based instruction: Teacher views regarding the use of Web-based instruction.
- Web-pedagogical content knowledge: Knowing how to use Web's components and functions in educational environments.
- Web-content knowledge: How Web and content (subject area) support each other mutually (Horzum & Güngören, 2012; Lee & Tsai, 2010).

“Skill of using information technology” is one of the common skills specified in the primary education curricula which take the constructivist approach as basis and have been being implemented in Turkey since 2005. This skill is one of the main contents of courses such as technology & design, science, and information technology & software (Ünal, Özmen, & Er, 2013). However, “using information technology” is also included in the social studies curriculum (MEB, 2005) as a skill and is stated to be among the skills which students are expected to acquire within the scope of this course as follows: “Using computer based on directions; saving, formatting, and reusing the information collected from different sources of information and presenting the formatted information in the computer environment; preparing a report on multimedia by using texts, graphs, colors, and sound effects; reaching the information by using telephone and television networks; and using the technological products available in the daily life for appropriate purposes.” What teachers have to do is expressed in the explanations about implementation part of the social studies curriculum. According to these explanations, “The teacher has to integrate simulation programs, multimedia, hypermedia, and telecommunication services (e.g. the Internet) into the social studies course within the bounds of possibility. S/he has to organize, over the Internet, virtual field trips to those places to which they cannot organize real trips.” “Skill of using information technology”, which is emphasized in the social studies curriculum as a skill students are required to acquire, the obligation to utilize information and communications technology in classes imposed on social studies teachers, and the report of EU Kids Online (2012) collectively indicate the importance of social studies teachers' effectively using information technology in general and Internet/Web technologies in particular. On the other hand, social studies teachers' current use of Internet/Web technologies, their tendency to use these technologies in education, and their perception levels regarding these technologies play a determining role in the efficient use of these technologies. Hence, it is important to investigate and determine social studies teachers' perceptions levels regarding Web pedagogical content knowledge.

When relevant previous studies in literature are examined, it is seen that there are many studies on technological pedagogical content perception (Archambault & Barnett, 2010; Gönen & Kocakaya, 2015; Karadeniz & Vatanartıran, 2015; Kazu & Erten, 2014; Koh, Chai, Benjamin, & Hong, 2015; Şimşek et al., 2013; Voogt, Fisser, Pareja-Roblin, Tondeur, & Van Break, 2013) and Web pedagogical content perception (Akayüre & Nabie, 2013; Akgün, 2013; Arabacıoğlu & Dursun, 2015; Campos, Alvarez-Gonzalez, & Livingstone, 2012; Çağırğan, 2013; M. Ekici, D. Ekici, & Altunışık, 2015; Gömleksiz & Fidan, 2011; Gömleksiz & Erten, 2013; Hiğde, Uçar, & Demir, 2014; Horzum, 2011; Horzum, 2012; Horzum & Güngören, 2012; Kavanoz, Yüksel, & Özcan, 2015; Kazu & Erten, 2011; Lee, Tsai, & Chang, 2008; Lee & Tsai, 2010; Yazar & Şimşek, 2015), but, there is no study involving social studies teachers in this matter. When the studies in this matter covering pre-service teachers including pre-service social studies teachers were examined, the samples were seen to give an inadequate coverage to social studies teaching.

As an example from relevant previous studies, Akgün's (2013) study titled “Preservice Teachers' Web Pedagogical Content Knowledge and Relationship Between Teachers' Perceptions of Self-Efficacy” was conducted with a study group consisting of 214 preservice teachers (including 149 females and 65 males) from the fourth grade of different departments of Education Faculty at Trakya University in the 2011-2012 academic year. According to the study results, there is a positive relationship between pre-service teachers' Web pedagogical content knowledge and their perceptions of teaching self-efficacy. 12 pre-service social studies teachers participated in that study. Gömleksiz & Erten (2013) conducted a study titled “Prospective Teachers' Perceptions of Web Specific Self-Efficacy” and tried to reveal the self-efficacy levels of pre-service teachers regarding the Web. 807 pre-service teachers from various faculties and departments participated in the study in total. According to the study results, male pre-service teachers have higher self-efficacy perceptions than female pre-service teachers while the self-efficacy perceptions of students from the Department of Computer Education and Instructional Technologies are higher than those of students from all the other departments. 68 social studies pre-service teachers participated in the abovementioned study in total.

Since there is no study in this matter devoted to social studies teachers, the results to be obtained from the present study are believed to contribute to literature as well as decision-makers and policy-makers.

### 1.1 Purpose of the Study

The main purpose of this study is to identify the Web pedagogical content knowledge perceptions of social studies teachers. The questions below were tried to be answered within the scope of the abovementioned main purpose:

- 1) What are the perception levels of social studies teachers regarding Web pedagogical content knowledge?
- 2) Do Web pedagogical content knowledge perceptions of social studies teachers differ based on
  - a. Gender,
  - b. Educational background,
  - c. The Department of graduation,
  - d. Status of having a computer,
  - e. The experience of using computers?

## 2. Method

### 2.1 Research Design

This study employed descriptive survey design, which is one of the quantitative research methods. Survey design allows the description of general tendencies, attitudes, or views either quantitatively or numerically through studies conducted on a sample group (Creswell, 2013, p. 155).

This study aims to analyze the perception levels of the social studies teachers in Turkey regarding Web pedagogical content knowledge. In other words, the factors having an influence on the results should be identified, and the result should be predicted in the best way. If a problem requires the identification of factors which have an influence on the results, quantitative approach is the best method (Creswell, 2013: 20). For this reason, this study employed descriptive survey design, a quantitative research method, which fits to its purpose.

### 2.2 The Population and the Sample

The population of the study covers the social studies teachers in Turkey while the sample of the study covers randomly selected 601 social studies teachers from 76 provinces of Turkey. The sample includes all the social studies teachers who were willing to fill in the quantitative data collection tool regardless of their gender, age, etc. All the participants answered all the questions in the scale. Demographical details regarding the social studies teachers who made up the sample group are given in Table 1 below.

Table 1. Demographical details of the social studies teachers who participated in the study

		f	%
Gender	Male	391	65.1
	Female	210	34.9
Educational Background	Undergraduate	566	94.2
	Postgraduate	35	5.8
The Department of Graduation	Department of Primary Social Studies Education	550	91.5
	Department of Secondary Social Sciences Education	51	8.5

### 2.3 Data Collection Tool

#### 2.3.1 Web Pedagogical Content Knowledge Scale

Data collection tool of the study is Web Pedagogical Content Knowledge Scale developed by Lee, Tsai, and Chang (2008) and adapted to Turkish by Horzum (2011). The scale consists of 30 items and five factors. Horzum conducted an explanatory factor analysis to demonstrate what kind of a structure the scale would yield with Turkish participants. Confirmatory factor analysis was also carried out to analyze the structure of the scale and its fitness to the collected data. The five-factor structure of the original scale yielded a five-factor structure with Turkish participants as well. Factors are respectively named as follows: Web-general, Web-communicative,

Web-pedagogical, Web pedagogical content, and Attitude towards Web-based instruction. Cronbach's alpha value of the entire scale was found to be .94. "Web-general", one of the factors of the scale, has a reliability value of .88 while the second factor, "Web-communicative", has .91. The third factor, "Web-pedagogical", has .95, and the fourth factor, "Web pedagogical content", has .90. Finally, the fifth factor, "Attitude towards Web-based instruction", has .92. Having all the internal consistency values higher than .85 is indicative of really high reliability. In other words, it is possible to say that the scale yields very consistent data. In the present study, Cronbach's alpha value of the entire scale was found to be .95. The first factor, "Web-general" was found to have a reliability value of .88; the second factor, "Web-communicative" .86; the third factor, "Web-pedagogical" .89; the fourth factor, "Web pedagogical content" .94; and the fifth factor, "Attitude towards Web-based Instruction" .86.

### 2.3.2 Personal Data Form

Personal data form developed by the researcher was used in the study to reveal the participants' gender, the province they lived in, their educational backgrounds, their Department of graduation, whether they had a computer and their experience of computer usage. Close-ended questions were prepared for all the variables except for the province in which they lived. The participants were asked to select the option appropriate for them.

### 2.4 Data Analysis

The variables used in the data collection tools were as follows:

The variable of educational background has three categories in total, which are bachelor's, master's, and doctoral degrees. However, master's and doctoral categories were combined under postgraduate category to make the sizes of these three sub-groups appropriate for the independent t-test ( $n > 30$ ). The data regarding the variable were transformed into two sub-groups (Bachelor's, Postgraduate).

The variable of the Department of graduation has five categories in total, which are the Department of social studies education, the Department of history education, the Department of history, the Department of geography education, and the Department of geography. However, the categories of the Department of history education, the Department of history, the Department of geography education, and the Department of geography were combined under the category of the Department of secondary social studies education to make the sizes of these five sub-groups appropriate for the independent t-test ( $n > 30$ ). The data regarding the variable were transformed into two sub-groups (i.e. Department of Primary Social Studies Education, Department of Secondary Social Sciences Education).

Levene and Kolmogorov-Smirnov tests were performed via SPSS to see whether the data met the principle of normal distribution, which is one of the parametrical test principles. It was seen that the data did not show a parametrical distribution ( $p < .05$ ). Therefore, non-parametrical tests were employed to analyze the data.

The findings obtained from the study were analyzed based on arithmetic mean, standard deviation, Mann-Whitney U test, and Kruskal-Wallis test. Whether the data were significant or not was evaluated at a significance level of 0.05.

The logic of 5 columns four ranges was employed to determine the range of arithmetic means. The value of this range refers to  $4/5 = 0.8$ . Accordingly

1.00–1.79 refers to I strongly disagree

1.80–2.59 refers to I disagree

2.60–3.39 refers to I am neutral

3.40–4.19 refers to I agree

4.20–5.00 refers to I strongly agree.

## 3. Findings

### 3.1 Findings Regarding the First Sub-Question

In relation to the first sub-question of the study, "What are the perception levels of social studies teachers regarding Web pedagogical content knowledge?", the arithmetic means of the data were calculated.

Table 2. Descriptive data regarding the social studies teachers' Web pedagogical content knowledge perception levels

	Items	N	$\bar{X}$	Sd.
Web-general	1. I can click on the hyperlink to connect to another website.	601	4.41	.88
	2. I can enter the address of the website to connect a certain website.	601	4.70	.64
	3. I can print the content of a website.	601	4.72	.64
	4. I can use keywords to search something on the web.	601	4.75	.62
	5. I can download images from the web.	601	4.78	.61
	6. I can use search engines on the web.	601	4.81	.49
	7. I can copy the texts on the web to a Word file.	601	4.77	.60
Web-communicative	8. I can read other people's messages in a chat room.	601	4.33	1.13
	9. I can take a nickname for myself in a chat room.	601	4.56	.88
	10. I can chat with others one to one in a chat room.	601	4.52	.89
	11. I can reply or provide information to another person in a Bulletin Board System.	601	4.28	.98
Web-pedagogical	12. I know that web technology is capable of providing various materials that can enrich the course content.	601	4.48	.76
	13. I can make research on internet resources for course content.	601	4.69	.63
	14. I can select the most appropriate content from web resources.	601	4.62	.69
	15. I can search online materials relevant to course content.	601	4.53	.80
	16. I can search various materials that can be integrated into course content from web.	601	4.60	.68
Perceptions Regarding the Web Pedagogical Content Knowledge	17. I can use instruction modules on the web in lectures.	601	4.53	.70
	18. I can use web technologies to improve instruction.	601	4.54	.72
	19. I can use web to improve the learning motivations of students.	601	4.53	.70
	20. I can choose appropriate ones among web-based courses to support instruction.	601	4.47	.71
	21. I can use web technology to employ multiple instruction strategies for a certain unit of a course.	601	4.45	.78
	22. I can guide students to use web resources to learn a certain unit of a course.	601	4.44	.76
	23. I can use web resources to guide students for learning activities of a certain unit of a course.	601	4.47	.68
	24. I can use web technology to support the content of a special course unit.	601	4.49	.66
Attitude Towards Web-Based Instruction	25. Web technology can actually be used for instruction practices.	601	4.45	.60
	26. Web's features can support the instruction.	601	4.50	.61
	27. Web technology can improve instruction skills.	601	4.48	.70
	28. Resources about web can enhance course content.	601	4.57	.57
	29. Web-based instruction can improve the learning motivation of students.	601	4.52	.66
	30. Web-based instruction is a trend in education for future.	601	4.51	.75
<b>Total</b>		601	4.65	.62

When the Table 2 is examined, it is seen that the perception levels of the social studies teachers regarding Web pedagogical content knowledge mostly correspond to “I strongly agree” level on the scale and all the sub-dimensions. Based on this result, it is possible to say that the social studies teachers mostly have high levels of Web pedagogical content knowledge, and they consider themselves competent in this matter.

### 3.2 Findings Regarding the Second Sub-Question

In relation to the second sub-question of the study, “Do Web pedagogical content knowledge perceptions of social studies teachers differ based on gender, educational background, the Department of graduation, status of having a computer, and experience of using computers?”, arithmetic means of the data were calculated. Mann-Whitney U test and Kruskal-Wallis test for independent groups were performed over the variables whose arithmetic means were calculated.

Table 3. Mann-Whitney U test results regarding the perception levels of the social studies teachers concerning web pedagogical content knowledge by gender

Gender	N	Mean rank	Total rank	U	Z	p
Male	391	314.65	123029.50	35716.50	-3.242	.001*
Female	210	275.58	57871.50			

\*  $p < 0.05$ .

As seen in the Table 3, whether the perception levels of the social studies teachers regarding web pedagogical content knowledge differ by gender was analyzed via Mann-Whitney U test. At the end of the analysis, it was seen that the perception levels of the social studies teachers regarding web pedagogical content knowledge differ significantly by gender ( $U=35716.50$ ,  $p < 0.05$ ). The mean ranks indicate that the difference by gender is for the male teachers. In this sense, it is possible to say that male social studies teachers consider themselves more competent in terms of Web pedagogical content knowledge.

Table 4. Mann-Whitney U test results regarding the social studies teachers' perception levels concerning web pedagogical content knowledge by gender based on sub-dimensions

Sub-Dimensions	Gender	N	Mean rank	Total rank	U	Z	p
Web-general	Male	391	309.46	120998.00	37748.00	-2.463	.014*
	Female	210	285.25	59903.00			
Web-communicative	Male	391	314.77	123076.00	35670.00	-3.161	.002*
	Female	210	275.36	57825.00			
Web-pedagogical	Male	391	310.61	121449.50	37296.50	-2.301	.021*
	Female	210	283.10	59451.50			
Web pedagogical content knowledge	Male	391	307.85	120368.00	38378.00	-1.486	.137
	Female	210	288.25	60533.00			
Attitude towards Web-based Instruction	Male	391	312.08	122025.00	36721.00	-2.432	.015*
	Female	210	280.36	58876.00			

\*  $p < 0.05$ .

As seen in the Table 4, the perception levels of the social studies teachers regarding web pedagogical content knowledge were analyzed via Mann-Whitney U test to see under which sub-dimensions there are significant differences by gender. The analysis results show significant differences between the social studies teachers under the sub-dimensions of Web-general ( $U=37748.00$ ,  $p < 0.05$ ), Web-communicative ( $U=35670.00$ ,  $p < 0.05$ ), Web-pedagogical ( $U=37296.50$ ,  $p < 0.05$ ), and Attitude towards Web-based instruction ( $U=36721.00$ ,  $p < 0.05$ ). The mean ranks demonstrate that the difference is for the male teachers in all the sub-dimensions.

Table 5. Mann-Whitney U test results regarding the social studies teachers' perception levels concerning web pedagogical content knowledge by educational background

Educational Background	N	Mean rank	Rank total	U	Z	p
Bachelor's	566	299.28	169394.50	8933.500	-1.201	.230
Postgraduate	35	328.76	11506.50			

The Table 5 shows Mann-Whitney U test results regarding whether the social studies teachers' perception levels concerning web pedagogical content knowledge differ by educational background. At the end of the analysis, it was seen that the social studies teachers' perception levels concerning Web pedagogical content knowledge do not differ by educational background ( $U=8933.500$ ,  $p>0.05$ ).

Table 6. Mann-Whitney U test results regarding the social studies teachers' perception levels concerning Web pedagogical content knowledge by educational background based on sub-dimensions

Sub-dimensions	Educational background	N	Mean rank	Total rank	U	Z	p
Web-general	Bachelor's	566	299.89	169736.00	9275.00	-.955	.339
	Postgraduate	35	319.00	11165.00			
Web-communicative	Bachelor's	566	299.07	169272.00	8811.00	-1.307	.191
	Postgraduate	35	332.26	11629.00			
Web-pedagogical	Bachelor's	566	299.67	169614.50	9153.50	-.937	.349
	Postgraduate	35	322.47	11286.50			
Web pedagogical content knowledge	Bachelor's	566	297.50	168382.50	7921.50	-2.242	.025*
	Postgraduate	35	357.67	12518.50			
Attitude towards Web-based instruction	Bachelor's	566	301.47	170633.00	9638.00	-.305	.760
	Postgraduate	35	293.37	10268.00			

\*  $p<0.05$ .

The Table 6 shows Mann-Whitney U test results regarding whether the social studies teachers' perception levels concerning Web pedagogical content knowledge differ significantly by the educational background in sub-dimensions. At the end of the analysis, it was seen that there is no significant difference in 5 sub-dimensions by educational background; but there is a significant difference in the sub-dimension of Web pedagogical content knowledge ( $U=7921.50$ ,  $p<0.05$ ). The mean ranks indicate that the difference in the sub-dimension of Web pedagogical content knowledge is for the social studies teachers receiving a postgraduate education.

Table 7. Mann-Whitney U test results regarding the social studies teachers' perception levels concerning Web pedagogical content knowledge by the Department of graduation

The Department of graduation	N	Mean rank	Total rank	U	Z	p
Department of Primary Social Studies Education	550	305.73	168149.00	11426.00	-2.700	.007*
Department of Secondary Social Sciences Education	51	250.04	12752.00			

\*  $p<0.05$ .

As seen in the Table 7, whether the perception levels of the social studies teachers regarding Web pedagogical content knowledge differ according to the Department of graduation was analyzed via Mann-Whitney U test. At the end of the analysis, it was seen that there is a significant difference between the perception levels of the

social studies teachers regarding Web pedagogical content knowledge according to the Department of graduation (U=11426.00,  $p<0.05$ ). The mean ranks indicate that the difference is for the social studies teachers who graduated from the Department of primary social studies education.

Table 8. Mann-Whitney U test results regarding the social studies teachers' perception levels concerning Web pedagogical content knowledge by the Department of graduation based on sub-dimensions

Sub-dimensions	The Department of graduation	N	Mean rank	Total rank	U	Z	p
Web-general	Department of Primary social studies education	550	303.33	166830.00	12745.00-1.631		.103
	Department of secondary social studies education	51	275.90	14071.00			
Web-communicative	Department of Primary social studies education	550	307.86	169322.00	10253.00-3.788		.000*
	Department of secondary social studies education	51	227.04	11579.00			
Web-pedagogical	Department of Primary social studies education	550	305.47	168007.00	11568.00-2.574		.010*
	Department of secondary social studies education	51	252.82	12894.00			
Web pedagogical content knowledge	Department of Primary social studies education	550	304.90	167695.50	11879.50-2.038		.042*
	Department of secondary social studies education	51	258.93	13205.50			
Attitude towards Web-based instruction	Department of Primary social studies education	550	305.78	168178.00	11397.00-2.523		.012*
	Department of secondary social studies education	51	249.47	12723.00			

\* $p<0.05$ .

As seen in the Table 8, whether the perception levels of the social studies teachers regarding Web pedagogical content knowledge differ according to the Department of graduation in sub-dimensions was analyzed via Mann-Whitney U test. The analysis results show that there are significant differences between the social studies teachers under the sub-dimensions of Web-communicative (U=10253.00,  $p<0.05$ ), Web-pedagogical (U=11568.00,  $p<0.05$ ), Web pedagogical content knowledge (U=11879.50,  $p<0.05$ ), and attitude towards Web-based instruction (U=11397.00,  $p<0.05$ ). The mean ranks indicate that the difference is for the teachers who graduated from primary social studies education in all the sub-dimensions.

Table 9. Mann-Whitney U test results of the social studies teachers' perception levels concerning Web pedagogical content knowledge by status of having a computer

Status of having a computer	N	Mean rank	Total rank	U	Z	p
Yes	552	304.34	167994.00	11682.00	-1.949	.051
No	49	263.41	12907.00			

As seen in the Table 9, whether the perception levels of the social studies teachers regarding Web pedagogical content knowledge differ according to the status of having a computer was analyzed via Mann-Whitney U test. As it is clear in the table, the perception levels of the social studies teachers regarding Web pedagogical content knowledge do not differ according to the status of having a computer (U=8933.500,  $p>0.05$ ).

Table 10. Mann-Whitney U test results regarding the social studies teachers' perception levels concerning Web pedagogical content knowledge according to the status of having a computer based on sub-dimensions

Sub-Dimensions	Does s/he have a computer?	N	Mean rank	Total rank	U	Z	p																																												
Web-general	Yes	552	303.71	167650.00	12026.00	-1.944	.052																																												
	No	49	270.43	13251.00				Web-communicative	Yes	552	302.74	167113.00	12563.00	-.983	.326	No	49	281.39	13788.00	Web-pedagogical	Yes	552	302.55	167008.50	12667.50	-.914	.361	No	49	283.52	13892.50	Web pedagogical content knowledge	Yes	552	302.34	166890.50	12785.50	-.714	.475	No	49	285.93	14010.50	Attitude towards Web-based instruction	Yes	552	302.27	166851.50	12824.50	-.684	.494
Web-communicative	Yes	552	302.74	167113.00	12563.00	-.983	.326																																												
	No	49	281.39	13788.00				Web-pedagogical	Yes	552	302.55	167008.50	12667.50	-.914	.361	No	49	283.52	13892.50	Web pedagogical content knowledge	Yes	552	302.34	166890.50	12785.50	-.714	.475	No	49	285.93	14010.50	Attitude towards Web-based instruction	Yes	552	302.27	166851.50	12824.50	-.684	.494	No	49	286.72	14049.50								
Web-pedagogical	Yes	552	302.55	167008.50	12667.50	-.914	.361																																												
	No	49	283.52	13892.50				Web pedagogical content knowledge	Yes	552	302.34	166890.50	12785.50	-.714	.475	No	49	285.93	14010.50	Attitude towards Web-based instruction	Yes	552	302.27	166851.50	12824.50	-.684	.494	No	49	286.72	14049.50																				
Web pedagogical content knowledge	Yes	552	302.34	166890.50	12785.50	-.714	.475																																												
	No	49	285.93	14010.50				Attitude towards Web-based instruction	Yes	552	302.27	166851.50	12824.50	-.684	.494	No	49	286.72	14049.50																																
Attitude towards Web-based instruction	Yes	552	302.27	166851.50	12824.50	-.684	.494																																												
	No	49	286.72	14049.50																																															

\*  $p < 0.05$ .

As seen in the Table 10, whether the perception levels of the social studies teachers regarding Web pedagogical content knowledge differ according to the status of having a computer in sub-dimensions was analyzed via Mann-Whitney U test. It was seen that the perception levels of the social studies teachers regarding Web pedagogical content knowledge do not differ according to the status of having a computer in any of the sub-dimensions. The mean ranks indicate a difference for the social studies teachers who have a computer, but, this difference is not statistically significant.

Table 11. Kruskal-Wallis test results regarding the perception levels of the social studies teachers concerning Web pedagogical content knowledge by experience of using computers

Sub-Dimensions	Experience of using computers	N	Mean rank	sd	$\chi^2$	p	Significant difference
Web-general Web-communicative	1-3 Years (a)	28	222.64	3	18.075.000*		ab
	4-7 Years (b)	159	294.96				a-c
	8-12 Years (c)	208	299.25				ad
	Over 12 years (d)	206	318.08				bad
Web-pedagogical Web pedagogical content knowledge	1-3 Years (a)	28	205.82	3	21.542.000*		ab
	4-7 Years (b)	159	295.86				a-c
	8-12 Years (c)	208	289.22				ad
	Over 12 years (d)	206	329.80				bad
Attitude towards Web-based instruction Web-general	1-3 Years (a)	28	263.73	3	14.105.003*		ad
	4-7 Years (b)	159	291.47				bad
	8-12 Years (c)	208	284.96				cd
	Over 12 years (d)	206	329.61				
Web-communicative Web-pedagogical	1-3 Years (a)	28	226.18	3	17.401.001*		ab
	4-7 Years (b)	159	303.55				ad
	8-12 Years (c)	208	280.69				cd
	Over 12 years (d)	206	329.70				

	1-3 Years (a)	28	279.38		
Web pedagogical content knowledge	4-7 Years (b)	159	312.60	3	9.208 .027*
	8-12 Years (c)	208	277.50		
	Over 12 years (d)	206	318.72		
					B-C
					cd

Considering the Table 11, it is seen that the perception levels of the social studies teachers regarding Web pedagogical content knowledge significantly differ in all of the sub-dimensions by experience of using computers ( $p < 0.05$ ). According to the Mann-Whitney U test results, which was conducted in order to see between which groups there are differences, in the sub-dimension of Web-general, the group who has 1-3 (SO=222.64) years of experience is different from the groups who have 4-7 years (SO=294.96) of experience, 8-12 years (SO=299.25) of experience, and over 12 years (SO=318.08) of experience while the group who has 8-12 of experience is different from the group who has over 12 years of experience. In the sub-dimension of Web-communicative, the group who has 1-3 years (SO=205.82) of experience is different from the groups who have 4-7 years (SO=295.86) of experience, 8-12 years (SO=299.25) of experience, and over 12 (SO=329.80) years of experience. In the sub-dimension of Web-pedagogical, the group who has over 12 years (SO=329.61) of experience is different from the groups who have 1-3 years (SO=263.73) of experience and 8-12 years (SO=284.96) of experience. In the sub-dimension of Web-pedagogical content knowledge, the group who has 1-3 years (SO=226.18) of experience is different from the groups who have 4-7 years (SO=303.55) of experience and over 12 years (SO=329.70) of experience whereas the group who has 8-12 years (SO=) of experience is different from the group who has over 12 years of experience. In the sub-dimension of attitude towards web-based instruction, the group who has 8-12 years (SO=277.50) of experience is different from the groups who have 4-7 years (SO=312.60) of experience and over 12 years (SO=318.72) of experience. Considering the mean ranks, it is possible to say that as the experience of using computers increases, the positive influence of this increase on perception levels regarding Web pedagogical content knowledge increases as well.

#### 4. Discussion and Conclusion

This study is an attempt to reveal the Web pedagogical content knowledge levels of the social studies teachers in Turkey and whether these levels differ by gender, educational background, the Department of graduation, status of having a computer, and experience of using computers.

According to the analyses results obtained within the frame of the first sub-question of the study, the perception levels of the social studies teachers regarding Web pedagogical content knowledge generally correspond to “I strongly agree” level in the entire scale ( $\bar{X} = 4.65$ ) and in the sub-dimensions of the scale, which are Web-general ( $\bar{X} = 4.77$ ), Web-communicative ( $\bar{X} = 4.51$ ), Web-pedagogical ( $\bar{X} = 4.61$ ), Web pedagogical content knowledge ( $\bar{X} = 4.51$ ), and attitude towards web-based instruction ( $\bar{X} = 4.55$ ). Based on the results, it is possible to say that generally speaking, social studies teachers have high perception levels regarding Web pedagogical content knowledge and they consider themselves competent in this matter. This result, though there is no relevant study in literature devoted to social studies teachers, is consistent with the results of similar previous studies conducted with pre-service teachers (Akgün, 2013; M. Ekici, D. Ekici, & Altunışık, 2015; Gömleksiz & Erten, 2013; Gömleksiz & Fidan, 2011; Kavanoz, Yüksel, & Özcan, 2015; Lee & Tsai, 2010). It is possible to say that this is an inevitable result stemming from the widespread Web usage via PCs, tablets, and smart phones.

The second sub-question of the study is as follows: “Do Web pedagogical content knowledge perceptions of social studies teachers differ based on gender, educational background, the Department of graduation, status of having a computer, and experience of using computers?” It was seen that the perception levels of social studies teachers concerning Web pedagogical content knowledge significantly differ in favor of male teachers. The literature contains some studies indicating a significant difference between perception levels concerning web pedagogical content knowledge by gender (M. Ekici, D. Ekici, & Altunışık, 2015; Gömleksiz & Erten, 2013) whereas there are also studies indicating that there is no significant difference by gender (Akgün, 2013; Arabacıoğlu & Dursun, 2015; Hiğde, Uçar, & Demir, 2014; Kazu & Erten, 2011). Gömleksiz and Fidan (2011), on the other hand, found that pre-service teachers’ perception levels regarding Web pedagogical content knowledge significantly varied by gender only in the sub-dimension of Web-communicative, but there was no significant difference between their perception levels in other sub-dimensions by gender.

According to data analysis derived from the overall scale, though there is a partial difference between the perception levels of the social studies teachers concerning Web pedagogical content knowledge by educational

background, this difference is not statistically significant. Considering the analysis results regarding the sub-dimensions, there is a significant difference in favor of the social studies teachers receiving postgraduate education only in the sub-dimension of Web pedagogical content knowledge. There is no data regarding this variable in the relevant literature.

There is a significant difference between the perception levels of social studies teachers concerning Web pedagogical content knowledge by the Department of graduation. The analysis results regarding the scale's sub-dimensions show that there are significant differences in all of the sub-dimensions except for the sub-dimension of Web-general. There are studies in the relevant literature indicating a significant difference between the perception levels of pre-service teachers regarding Web pedagogical content knowledge by the Department of graduation (Akgün, 2013; Arabacıoğlu & Dursun, 2015; M. Ekici, D. Ekici, & Altunışık, 2015; Gömleksiz & Erten, 2013).

According to the analysis results obtained from the overall scale and its sub-dimensions, there is a partial difference between the perception levels of the social studies teachers concerning Web pedagogical content knowledge by the status of having a computer, but this difference is not significant. In the relevant literature, some studies indicate no significant difference between the perception levels of pre-service teachers concerning Web pedagogical content knowledge by status of having a computer (Ekici, Ekici, & Altunışık, 2015) while some studies indicate a significant difference (Arabacıoğlu & Dursun, 2015). A study conducted by Hiğde, Uçar, and Demir (2014) reports that while there is a significant difference between pre-service teachers studying science by the status of having a computer, there is no significant difference between pre-service teachers studying physics.

According to the results of the present study, there is a difference between the perception levels of the social studies teachers concerning Web pedagogical content knowledge by experience of using computers. There is no data in the relevant literature regarding this variable.

All in all, it is seen that the social studies teachers have high perception levels concerning Web pedagogical content knowledge. This result is quite positive considering what is specified in the social studies curriculum implemented in Turkey and what is expected from social studies teachers. As a matter of fact, the obtained results indicate that social studies teachers know how to use Web technologies personally and how to benefit from these technologies in social studies education and have a tendency to use them in social studies education. In this sense, the social studies teachers' having high perception levels concerning Web pedagogical content knowledge is an important result to make efficient use of WBIs for social studies education in Turkey.

The recommendations below can be put forward to successfully transfer social studies teachers' perceptions of Web pedagogical content knowledge to learning-teaching activities and to make proper use of Web-based instruction in social studies education:

- 1) Social studies teachers have high perception levels of Web pedagogical content knowledge. To make teachers efficiently use these results in learning-teaching processes, in-service training should be given concerning the efficient use of Web in social studies teaching. In this way, social studies teachers can manifest their high perception levels concerning Web pedagogical content knowledge in learning-teaching processes. Such in-service training should be for both male and female teachers.
- 2) Social studies teachers should be informed about the use of Web-based instruction material development tools on EBA (Education Informatics Network).
- 3) For pre-service social studies teachers studying in education faculties, a separate course titled Web-Based Instruction can be added to the curriculum of Department of Social Studies Education.
- 4) This study dwelt on the variables which are assumed to have an influence on perception levels concerning Web pedagogical content knowledge. New studies can be conducted by dealing with the variables other than the ones in this study.

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