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An Investigation of Pre-Service English Teachers' Self-Efficacy in Web Pedagogical Content Knowledge

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Abstract. The aim of this study is to identify pre-service English teachers' self-efficacy in web pedagogical content knowledge. The Web Pedagogical Content Knowledge (WPCK) is valuable in comparison to other technology-based models (e.g. TPACK) as it offers a holistic approach by integrating content knowledge with web knowledge specifically rather than focusing on technology in general. The sample of this study consists of 110 pre-service English teachers studying at two state universities in Istanbul and Sakarya, Turkey in the academic year of 2018-2019. The data was collected through "The Scale of Web Pedagogical Content Knowledge" developed by Lee, Tsai and Chang (2008) and adapted into Turkish by Horzum (2011). The data was analyzed through SPSS and the variables university, grade, gender, daily amount of time spent on the internet and social media were considered in addition to identifying participants' competence levels. The findings demonstrate that the participants have a high level ('I totally agree') of self-efficacy in the five sub-dimensions of WPCK. Out of the variables, only grade is observed to have a significant effect while university, gender, daily amount of time spent on the internet and daily amount of time spent on social networks are observed to have a no significant effect on self-efficacy levels. The analysis offers insights into pre-service teachers' competence and self-efficacy in the use of web for pedagogy, content knowledge, pedagogical knowledge and the integration of them. The findings of this study are expected to contribute to pre-service teacher training and the successful integration of the web into content knowledge for pedagogic purposes.

Keywords: Web pedagogical content knowledge; content knowledge, self-efficacy; pre-service English teachers.

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1. INTRODUCTION

Today we live in the technology age and our lives are constantly reshaped by the novelties technology brings. Therefore, individuals and societies need to catch up with the latest developments. Naturally, this also affects educational contexts, and curricula from pre-school to higher education are expected to be updated accordingly. In the 21st century, the internet as a part of technology has a significant role in our lives. Accordingly, pre-service teachers, who are going to be teaching the future students, should be equipped with the necessary and relevant skills to align with the requirements of the 21st century. Self-efficacy is a term coined by Bandura (1977). Self-efficacy can be defined as an individual's personal perception about how well s/he can undertake actions to deal a potential situation. However, teachers who can use the internet blended with appropriate pedagogical knowledge can create a context in which teachers can create an environment which allows students to control their learning and learn at their own pace (Bağcı, & Atar, 2018). In this sense, teachers' self-efficacy perceptions are of great importance as it is a determining factor in the integration of technology and web into their pedagogy, which is indispensable in our century (Akgün, 2013).

A relevant framework to WPCK is Technological Pedagogical Content Knowledge (TPACK). The model of (TPACK) is a significant model on the mutual relationship between technology and education (Koehler & Mishra, 2009). It is made up of the integration of pedagogical knowledge, content knowledge and technology knowledge. TPACK consists of a three-dimensional structure that is made up of Technology, Content and Pedagogy. It involves the integration of a specific content into a practice based on educational technology.

Lee, Tsai and Chang (2008) and Lee and Tsai (2010) introduced the term WPCK to underline the value of the integration of web knowledge, pedagogical knowledge and content knowledge. The dimensions of WPCK can be summarized as follows (Yeşiltaş, 2016, 111):

- Web-general: General command of Web.
- Web-communicative: Web-based communication or web-based interaction competences.
- Attitudes toward web-based instruction: Teachers' views regarding the use of Web-based instruction.
- Web-pedagogical content knowledge: Knowing how to use web's components and functions in educational environments for educational purposes.
- Web-content knowledge: How web and content (subject knowledge) affect and construct each other mutually (Lee, & Tsai, 2010).

The justification for this model is to have an amalgam of the knowledge types that teachers need to be successful and efficient teachers. TPACK focuses on technology in general (Yazar, & Şimşek, 2015; Bağcı, & Atar, 2018); however, WPCK specifically

focuses on the web aspect of technology. WPCK is the web knowledge for teaching and this is essential regarding the requirements of the 21st century. Accordingly, it is related to the dimensions of educational web programs and it is in line with educational goals. In WPCK education, the significant issue is to blend pedagogical and content knowledge and use the web to support them in a meaningful way. Namely, the constructive alignment of the three aspects is the critical point as it is expected to lead to better learning and teaching practices compared to traditional approaches. As for WPCK competence, here we can define it as the utilization of the web, pedagogy and content knowledge simultaneously in addition to the use and integration of appropriate web facilities in classrooms. In other words, WPCK competence is the ability to utilize the three areas (pedagogy, web and content knowledge) to create a better learning and teaching environment.

It may be argued that the use of web for content knowledge is essential and it can offer unique opportunities in line with the characteristics of the 21st century and this depends on pre-service teachers' self-efficacy in the use of web and content knowledge. They should blend their web knowledge with content knowledge to decide how they can be fruitful for students' learning. However, as will be argued in the literature review section below, there are not enough studies in this field and as it is a significant issue, further studies are needed. This study aims to contribute to this gap and be a response to this justification. Accordingly, this study aims to designate pre-service English teachers' self-efficacy levels in WPCK and whether this level varies depending on university, gender, grade, daily time spent on the internet and daily time spent on social networks.

Considering the discussion above, in accordance with the justification and the gap in the literature, the research questions of this study are:

1. What is the level of pre-service English teachers' self-efficacy level in WPCK?
2. Is this level affected by the variables university, grade, gender, daily amount of time spent on the internet and daily amount of time spent on social networks?

Literature Review

In accordance with the findings in the review of the literature, in the following paragraphs first, pre-service teachers' WPCK levels will be reviewed. Then, there will be a specific focus on pre-service English teachers and finally, in accordance with the focus of this study, pre-service teachers' self-efficacy in WPCK will be reviewed with regard to various variables.

Studies in WPCK are not very common, but there is a recent increase. There are various studies on the use of web for pedagogy in the world (e.g. Jimoyiannis, Tsiotakis, Roussinos, & Siorenta, 2013) but, there are only several studies on self-efficacy and/or WPCK in the Turkish context on teachers (e.g. Oskay, & Odabaşı, 2016; Yeşiltaş, 2016) and pre-service teachers (e.g. Gömleksiz, & Erten, 2013; Ekici, İnel Ekici, & Altunışık, 2015; Turan, & Koç, 2016; Hiğde, Uçar, & Demir, 2016; Karataş, & Aslan-Tutak, 2017;

Mazman Akar, 2019); however, there is still a lack of studies on pre-service English teachers in Turkey. The WPCK studies undertaken in the Turkish context on pre-service English teachers are quite few in number and most of them do not focus on them exclusively. For instance, Akgün (2013) found that pre-service teachers have a high level of WPCK. She further demonstrated that there is a positive correlation between pre-service teachers' WPCK and self-efficacy perceptions. Her sample also included pre-service English teachers; however, they are not evaluated separately and they are included in the general calculations with other pre-service teachers from various departments. In this sense, their WPCK level could not be classified clearly. One finding that is clear from her finding about pre-service English teachers is that they have a slightly higher average (138,76 versus 133,10) of WPCK in comparison to other pre-service teachers. Similarly, Aydın, Eroğlu and Horzum (2017) reported that pre-service English teachers have a statistically higher level of WPCK in comparison to those in the Turkish teaching department. They attributed this difference to the omnipresence of English in the Web, which is obviously an advantage for pre-service English teachers. They also found that pre-service English teachers have a high level of self-efficacy in WPCK. Yazar and Şimşek's (2015) study included pre-service English teachers, but the study does not focus on them specifically and there is no specific finding attributed to them. One final relevant study is Kavanoz, Yüksel and Özcan (2015) who focused on English as a foreign language pre-service teachers and their perceptions of their self-efficacy regarding WPCK. Their results suggest that pre-service English teachers have high scores on the Web-general knowledge and Web Pedagogical Knowledge subscales, while they have lower scores in Web Communicative and Web Pedagogical Content Knowledge sub-scales. The participants' level of general self-efficacy regarding WPCK has a positive correlation with their attitudes towards Web-based instruction. The study also suggests that there are no significant differences with regard to gender and grade differences.

In the literature there are also studies which study the effects of some variables on WPCK and self-efficacy in WPCK. One variable that is checked against WPCK levels is gender. Arabacıoğlu and Dursun (2015), and Gömleksiz and Fidan (2011) undertook a study on the WPCK levels of pre-service teachers with regard to several variables and their study suggested that gender does not have a significant effect on WPCK perception. Akgün (2013) also found that gender has a significant effect on pre-service teachers' WPCK levels. However, Gömleksiz and Erten (2013) found that males have more self-efficacy in WPCK compared to the females in their study. Similarly, Ekici et al. (2015) found that males have significantly higher scores in general web, pedagogical web, WPCK and attitudes towards web-based instruction sub-dimensions, but no significant difference was found in communicative web.

Another variable that is studied to see whether it affects WPCK levels is the use of the internet and social networks. Arabacıoğlu and Dursun's (2015) study suggested that the frequency of use in the internet and social networks has a significant effect. In the same

vein, Akgün (2013) and Turan and Koç (2016) found that the frequency of internet use has a significant effect on WPCK levels. Yazar and Şimşek (2015) and Gömleksiz and Erten (2013) also found that those who use the internet more have higher WPCK levels.

One final variable is the grade. To the knowledge of the researchers, there are two studies (Aydın, Eroğlu and Horzum, 2017; Ekici et al., 2015) which studied the effect of this variable. Ekici et al. (2015) found that 1st grade pre-service teachers are different than those at the 4th grade and those at the 2nd grade are found to significantly differ from those at the 4th grade. Aydın et al. (2017), on the other hand, found that grade has a significant effect on only WPCK and attitudes toward web-based education sub-dimensions.

2. METHODOLOGY

Research Design

The study was undertaken via survey model. Survey models aim to describe a phenomenon which exists in the past or present in order to depict it as it is. The individual or phenomenon in focus is described in its own context (Karasar, 2005). In addition, in accordance with the secondary goals of the study, correlational survey models were utilized.

The Sample

The sample of the study was formed via convenience sampling and it consists of 110 pre-service English teachers studying at 2 state universities in Sakarya and Istanbul, in Turkey, in the academic year of 2018-2019. The demographics of the sample is presented in Table 1 below.

Table 1.

The Sample

Variables		f	%
University	A State University in Sakarya	70	63,6
	A State University in Istanbul	40	36,4
Gender	Male	32	29,1
	Female	78	70,9
Grade	1st Year	33	30,0
	2nd Year	61	55,5
	3rd Year	16	14,5
Daily Internet Use	0-3 hours	33	30,0
	3-5 hours	39	35,5
	More than 5 hours	38	34,5

Daily Social Network Use	Less than 1 hour	22	20,0
	1-3 hours	45	40,9
	3-5 hours	27	24,5
	More than 5 hours	16	14,5
Total		110	100

110 Pre-service English teachers took part in the study. 32 (29,1%) of the participants are males, while 78 (70,9%) of them are female teacher candidates. 33 (30%) of them are 1st year students while 61 (55,5%) of them are 2nd year students and 16 (14,5%) of them are 3rd year students.

Data Collection Tool

In the study, a personal information form prepared by the researchers and the scale of Web Pedagogical Content Knowledge developed by Lee, Tsai and Chang (2008) and adapted into Turkish by Horzum (2011) was used. The scale consists of 30 items. The scale utilizes a 5-point Likert scale (1: I do not agree at all, 2: I do not agree, 3: I am undecided, 4: I agree, 5: I totally agree). The scale consists of a total of 5 factors. These factors are General Web consisting of 8 items, Communicative Web with 6 items, Pedagogical Web with 7 items, Web Pedagogical Content Knowledge with 5 items and Attitudes towards Web-Based Instruction with 4 items. The minimum point that can be obtained is 30 and the maximum point is 150. The Cronbach Alpha internal consistency score is .94 for the whole scale. The reliability for General Web sub factor was found as .88, .91 for Communicative Web, .95 for Pedagogical Web, .90 for Web Pedagogical Content Knowledge and .92 for Attitudes towards Web-Based Instruction. After the implementation of the scale on the pre-service English teachers, the Cronbach Alpha internal consistency was found as .98. The reliability for General Web sub factor was calculated as .95, .95 for Communicative Web, .92 for Pedagogical Web, .88 for Web Pedagogical Content Knowledge and .85 for Attitudes towards Web-Based Instruction.

Data Analysis

In the WPCK scale, the maximum point for each item is 5 while it is 1 for the minimum. Utilizing averages, 5 evaluation criteria and intervals were established to designate pre-service English teachers' self-efficacy levels in WPCK. (Table 2).

Table 2.

The Evaluation Criteria for Evaluating the Views on Teaching-Learning

Evaluation Criteria	Points	Evaluation Interval
I do not agree at all	1	1,00 – 1,80
I do not agree	2	1,81 – 2,60
I am undecided	3	2,61 – 3,40
I agree	4	3,41 – 4,20
I totally agree	5	4,21 – 5,00

The data collected from the teacher candidates were analyzed via SPSS 16.0 (Statistical Package for the Social Sciences). The significance level in the analysis is .05. The Levene Test was undertaken to find out whether the comparison of the data with regard to gender, university, grade, daily time spent on the internet and social networks is appropriate for normal distribution or not. While studying the differences in the variables that have two different sub-groups, independent samples t-test was used when there was normal distribution, and Mann Whitney-U test was used when there was not a normal distribution. While analyzing the differences between the variables which had more than two sub-groups, one-way variance analysis was used when there was normal distribution and Kruskal Wallis H test was used when there was not normal distribution.

3. FINDINGS

The WPACK Self-Efficacy Levels of Pre-service English Teachers

The results of the analysis undertaken to designate pre-service English teachers' self-efficacy in WPCK are presented below.

Table 3.

The WPCK Self-Efficacy Levels of Pre-service English Teachers

Sub Dimensions	$\overline{X}$	sd
General Web	4,36	,75
Communicative Web	4,46	,74
Pedagogical Web	4,55	,66
Web Pedagogical Content Knowledge	4,40	,73
Attitude towards Web-based Instruction	4,45	,76

The analysis suggests that regarding WPCK self-efficacy levels, pre-service English teachers' have a mean of 4,36 for general web, 4,46 for communicative web, 4,55 for pedagogical web, 4,40 for WPCK and 4,45 for attitudes towards web-based instruction. These results demonstrate that their level is at *I totally agree level* and this finding suggest that the participants have a positive perception of their self-efficacy in the sub-dimensions of WPCK.

In the literature, Kavanoz et al.'s (2015) study is a related study in terms of participants and the context. The current study suggests that pre-service English teachers have a high self-efficacy in all sub dimensions of WPCK. Kavanoz et al. (2015) also found high self-efficacy levels in the Web-general knowledge and Web Pedagogical Knowledge. However, they detected lower scores for Web Communicative and Web Pedagogical Content Knowledge dimensions. There seems to be a mismatch in these two sub dimensions, but as Kavanoz et al. (2015) suggest, their participants still have a relatively high level in these sub dimensions. Similarly, Akgün (2013) and Aydın et al. (2017) report that pre-service English teachers have high levels of WPCK. In this sense, the findings of the previous studies are mostly in line with the findings of this study and it may be suggested here that pre-service English teachers have a high level of self-efficacy in WPCK, which may be thanks to their frequent access and exposure to web in the modern world. As suggested by Aydın et al. (2017), the fact that pre-service English teachers have a good command of English may also be contributing to this level. Proficiency in English provides them access to most of the material on the web as English is the dominant language and as a result, they can find out various things on the web.

The Investigation of Pre-service English Teachers' Self-Efficacy in WPCK considering the Place Where They study

The results of the Mann Whitney-U test which was undertaken to understand whether the participants' self-efficacy levels differ according to the university at which they studied are presented below.

Table 4.

Pre-service English Teachers' Self-Efficacy in WPCK with regard to the place Where They Study

Sub Dimensions	Groups	n	$\overline{X}$	Sd	df	t	p
General Web	Sakarya	70	4,36	,69	108	.063	.950
	Istanbul	40	4,35	,85			
Communicative Web	Sakarya	70	4,52	,68	108	1.127	.262
	Istanbul	40	4,35	,83			

Pedagogical Web	Sakarya	70	4,57	,58	108	.383	.702
	Istanbul	40	4,52	,78			
Web Pedagogical Content Knowledge	Sakarya	70	4,39	,71	108	-.147	.883
	Istanbul	40	4,41	,77			
Attitudes towards Web-Based Instruction	Sakarya	70	4,45	,74	108	-.024	.981
	Istanbul	40	4,45	,80			

According to the analysis, pre-service English teachers' self-efficacy in WPCK does not show a significant difference in any of the sub-dimensions with regard to the university variable. The reason for this result may be stemming from the fact that the participants at both universities use web actively (Table 1). Also, they may spend time on the web for communication and education purposes. Consequently, they may have a positive attitude towards web-based instruction, which increases their positive attitudes towards the phenomenon. The act of using the web has the potential to lead to more positive attitudes as it provides familiarity to the users. So, it may be argued here that the participants' widespread use of the web (Table 1) might have had an effect in this finding.

Regarding the findings about the university variable, it can also be argued that the two universities as a variable are not observed to give way to a significant difference. Both universities are in top 20 in Turkey according university entrance examinations and in this sense, it may be argued that the pre-service teachers have similar competence and characteristics regarding content knowledge. Consequently, the university variable does not result in a significant difference. However, in a future study, two universities that have participants from top universities versus lower universities (according to university entrance examination rankings or some other ranking systems) may be compared or different variables depending on universities may be studied.

The Investigation of Pre-service English Teachers' Self-Efficacy in WPCK with regard to Gender

The results of the Mann Whitney-U test which was undertaken to understand whether the participants' self-efficacy levels differ according to gender are presented below.

Table 5.

Pre-service English Teachers' Self-Efficacy in WPCK with regard to Gender

Sub Dimensions	Groups	n	Rank Mean	Rank Sum	U	p
General Web	Male	32	57,70	1846,50	1177,500	.632
	Female	78	54,60	4258,50		
Communicative Web	Male	32	57,73	1847,50	1176,500	.617
	Female	78	54,58	4257,50		
Pedagogical Web	Male	32	58,19	1862,00	1162,000	.553
	Female	78	54,40	4243,00		
Web Pedagogical Content Knowledge	Male	32	59,86	1915,50	1108,500	.344
	Female	78	53,71	4189,50		
Attitudes towards Web-Based Instruction	Male	32	62,09	1987,00	1037,000	.132
	Female	78	52,79	4118,00		

According to the results, there is not a significance difference among the participants with regard to gender. The reason for this may be the fact that both females and males have similar competence in web use, that they can transfer web knowledge to education environments and that they have positive attitudes towards web-based teaching (see Tables 3 and 5).

A few studies in the literature investigate gender as a variable. Kavanoz et al.'s (2015) study is the only study on pre-service English teachers and they found that gender has no significant effect in line with the findings of this study. As for studies on pre-service teachers in various departments, they report inconsistent results. Arabacıoğlu and Dursun (2015), and Gömleksiz and Fidan (2011) found that gender does not have a significant effect on WPCK perception. Akgün (2013) also found that gender has no significant effect on pre-service teachers' WPCK levels. However, Gömleksiz and Erten (2013) found that males have higher self-efficacy in WPCK compared to the females in their study. Similarly, Ekici et al. (2015) found that males have significantly higher scores in general web, pedagogical web, WPCK and attitudes towards web-based instruction sub-dimensions, but no significant difference was found in communicative web. To sum up, this study found no significant relationship between gender and WPCK levels for pre-service English teachers. However, the studies in the literature regarding pre-service teachers provide conflicting results, which may stem from department differences. Consequently, the variable of gender may specifically be studied to unearth the issues around this variable.

The Investigation of Pre-service English Teachers' Self-Efficacy in WPCK with regard to Grade

The results of the Kruskall Wallis test which was undertaken to understand whether the participants' self-efficacy levels differ according to grade are presented below.

Table 6.

Pre-service English Teachers' Self-Efficacy in WPCK with regard to Grade

Sub Dimensions	Groups	n	Mean Rank	sd	X^2	p	Significance
General Web	1st Year	33	40,26	2	14.269	.001	2-1
	2nd Year	61	65,07				
	3rd Year	16	50,47				
Communicative Web	1st Year	33	40,30	2	12.577	.002	2-1
	2nd Year	61	63,25				
	3rd Year	16	57,31				
Pedagogical Web	1st Year	33	43,48	2	8.843	.012	2-1
	2nd Year	61	62,81				
	3rd Year	16	52,41				
Web Pedagogical Content Knowledge	1st Year	33	42,36	2	10.954	.004	2-1
	2nd Year	61	63,98				
	3rd Year	16	50,28				
Attitudes towards Web-Based Instruction	1st Year	33	40,65	2	11.966	.001	2-1
	2nd Year	61	63,79				
	3rd Year	16	54,53				

(1: 1st Year, 2: 2nd Year, 3: 3rd Year)

According to the results of the analysis, a significant difference is observed with regard to the year in which the participants study. In the scale it is [$X^2(2) = 14.269$, $p<.05$] for general web sub dimension, [$X^2(2) = 12.577$, $p<.05$] for communicative web, [$X^2(2) = 8.843$, $p<.05$] for pedagogical web, [$X^2(2) = 10.954$, $p<.05$] for web pedagogical content knowledge and [$X^2(2) = 11.966$, $p<.05$] for attitudes towards web-based instruction. In order to designate among which groups this difference exists, Mann Whitney U test was

utilized on the pair combinations of the groups. According to the results of the Mann Whitney U test, the self-efficacy levels of the students in the 2nd year are higher in general web, communicative web, pedagogical web and WPCK in comparison to those in the 1st year. Moreover, the ones in the 2nd year are found to have a more positive attitude towards web-based instruction in comparison to the ones in the 1st year.

In the literature, Kavanoz et al. (2015) found that there is no relationship between grade and WPCK levels. However, the results of this study suggest that there is a significant difference and the findings suggest that the prospective teachers in the 2nd year have higher scores in comparison to 1st graders although there is only one year difference. This difference may be attributed to the pre-service teachers' exposure to more content knowledge and the use of web for pedagogic purposes in their courses. Accordingly, they may have improved their WPCK skills by learning and applying the things that they have learned at their university as they progress from the 1st year to the next years.

As for the studies on grade as a variable on pre-service teachers in other departments, to the knowledge of the researchers, there are only two studies (Aydın et al., 2017; Ekici et al., 2015) which study the effect of this variable. Ekici et al. (2015) found that pre-service teachers in the 1st grade are different than those in the 4th grade and those in the 2nd grade are found to significantly differ from those in the 4th grade. Aydın et al. (2017), on the other hand, found that grade has a significant effect on only web pedagogical content knowledge and attitudes towards web-based education. From these results, combined with the findings of this study, it seems that grade has a role in WPCK level although it is not omnipresent and it may affect only some of the sub dimensions of WPCK.

The Investigation of Pre-service English Teachers' Self-Efficacy in WPCK with regard to Daily Internet Use

The results of the one-way variance analysis test which was undertaken to understand whether the participants' self-efficacy levels differ according to the daily time spent on the internet are presented below.

Table 7.

Pre-service English Teachers' Self-Efficacy in WPCK considering Daily Internet Use

Sub Dimensions	The Source of Variance	K.T	sd	K.O	F	p	Significance
General Web	Inter group	,022	2	,011	.019	.981	No
	In group	61,200	107	,572			
	Total	61,222	109				

Communicative Web	Inter group	,489	2	,245			
	In group	59,021	107	,552	.444	.643	No
	Total	59,510	109				
Pedagogical Web	Inter group	,237	2	,119			
	In group	46,665	107	,436	.272	.762	No
	Total	46,902	109				
Web Pedagogical Content Knowledge	Inter group	,264	2	,132			
	In group	57,814	107	,540	.245	.783	No
	Total	58,079	109				
Attitudes towards Web-Based Instruction	Inter group	,363	2	,182			
	In group	62,149	107	,581	.313	.782	No
	Total	62,512	109				

The results show that daily internet use does not have a significant effect on their self-efficacy scores in any of the sub dimensions of the scale. The findings of this study show that the daily amount of internet use does not have a significant effect on WPCK levels and self-efficacy. This finding is in contrast with the findings in the literature. For instance, Arabacıoğlu and Dursun (2015) found that the frequency of use in the internet and social networks has a significant effect on WPCK levels. In the same vein, Akgün (2013) and Turan and Koç (2016) found that the frequency of internet use has a significant effect on pre-service teachers' WPCK levels. Yazar and Şimşek (2015) and Gömleksiz and Erten (2013) also found that those who use the internet more have higher WPCK levels. So, quite a few studies that have been reviewed in the literature review all agree that daily amount of internet has a significant effect on pre-service teachers' WPCK levels. This means that internet use is a positive contribution with regard to pre-service teachers' self-efficacy. However, our study reports a different finding. The reason for this may be because, even if there is a difference between the amount of time, the perception towards the web may not be changing towards the use of web for education and communication purposes. Also, it may be argued that they are able to understand the content on education in the environment and also, their attitudes are similar considering the attitudes towards web-based instruction. These reasons may account for the absence of a significant difference depending on this variable.

The Investigation of Pre-service English Teachers' Self-Efficacy in WPCK with regard to the Daily Amount of Time Spent on Social Networks

The results of the Kruskall Wallis test which was undertaken to understand whether the participants' self-efficacy levels differ according to the daily time spent on social networks are presented below.

Table 8.

Pre-service English Teachers' Self-Efficacy considering the Daily Amount of Time Spent on Social Networks

Sub Dimensions	Groups	n	Mean Rank	sd	X^2	p	Significance
General Web	Less than 1	22	55,52	3	1.269	.736	No
	1-3 hours	45	57,66				
	3-5 hours	27	49,94				
	More than 5	16	58,78				
Communicative Web	Less than 1	22	56,14	3	1.976	.577	No
	1-3 hours	45	56,93				
	3-5 hours	27	49,07				
	More than 5	16	61,44				
Pedagogical Web	Less than 1	22	54,32	3	1.082	.781	No
	1-3 hours	45	57,11				
	3-5 hours	27	51,09				
	More than 5	16	60,03				
Web Pedagogical Content Knowledge	Less than 1	22	54,32	3	2.112	.549	No
	1-3 hours	45	57,11				
	3-5 hours	27	51,09				
	More than 5	16	60,03				
Attitudes towards Web-Based Instruction	Less than 1	22	58,48	3	1.363	.714	No
	1-3 hours	45	55,30				
	3-5 hours	27	50,65				
	More than 5	16	60,16				

The results show that daily amount of time spent on social networks does not have a significant effect on the participants' WPCK scores in any of the sub dimensions of the scale. The reason for this may be because, even if the time spent on social networks vary, they can understand the content on the web and they have similar attitudes towards web-based instruction. In fact, this is supported by the literature (e.g. Bağcı & Atar, 2018) and pre-service English teachers were found to have a high level of acceptance for social networks for educational purposes. Therefore, as most of the pre-service English teachers have a highly positive attitude towards social networks for instructional purposes, the amount of time spent on social networks may not lead to a significant difference on WPCK levels. In the literature, Arabacıoğlu and Dursun (2015) found that daily amount of time spent on social networks is observed to have a significant effect. This means that social networks use is a positive contribution with regard to pre-service teachers' self-efficacy and maybe considering the fact that social networks are sometimes seen as inappropriate environments for educational purposes, we may start considering social network use as a sole socialization or fun environment. Even the sheer use of social networks, which has nothing to do with education, may be contributing to pre-service teachers' self-efficacy in WPCK.

4. CONCLUSION

This study set out to identify pre-service English teachers' self-efficacy in WPCK. The sample of this study consists of 110 pre-service English teachers studying at two state universities in Istanbul and Sakarya, Turkey. The data was collected through The Scale of Web Pedagogical Content Knowledge developed by Lee, Tsai and Chang (2008) and adapted into Turkish by Horzum (2011). The data was analyzed through SPSS and the variables university, grade, gender, daily amount of time spent on the internet and social media were considered in addition to identifying participants' competence levels. The findings demonstrated that the participants had a high level (at 'I totally agree' level) of self-efficacy in the five sub dimensions of WPCK. Out of the variables, only grade was observed to have a significant effect, and university, gender, daily amount of time spent on the internet and daily amount of time spent on social networks were observed to have no significant effects on self-efficacy levels. Grade was found to have a significant effect on WPCK levels in that pre-service English teachers in the later grades were found to have higher self-efficacy in WPCK. The analysis offers insights into pre-service teachers' competence in the use of web for pedagogy, content knowledge, pedagogical knowledge and the integration of them. The findings of this study are expected to contribute to pre-service teacher training and the successful integration of the web into content knowledge for pedagogic purposes.

The findings of this study may offer unique opportunities in line with the characteristics of the 21st century which depends on pre-service teachers' efficacy in the use of web and content knowledge. They should blend their technology knowledge with content knowledge to decide how they can be fruitful for students' learning. As the findings of

this study showed that the pre-service Emglish teachers have a high level of self-efficacy in WPCK in general, which is also supported by the literature, the focus of the future studies should be on further issues. For instance, how WPCK can be used to improve actual teaching practices may be considered. One suggestion may be to use reflection (Nilsson, 2008) and reflective practice (Walsh, 2011; Atar & Seedhouse, 2018). Through reflective practice, pre-service teachers can have a chance to watch, discuss and analyze their teaching in the class and they may discuss how they can improve their teaching via the WPCK they already have. Also, WPACK focuses on the competence of the pre-service teachers in general. In the future studies, a qualitative study may be undertaken to understand the whats and hows of web knowledge and its relation to pedagogy.

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