NEW TECHNOLOGIES IN MICROTEACHINGS: IS IT POSSIBLE FOR WEB 2.0 TOOLS TO AFFECT PROSPECTIVE TEACHERS' WEB PEDAGOGICAL CONTENT KNOWLEDGE AND SELF-EFFICACY?

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Abstract

The purpose of this study was to determine the effect of Web 2.0 tools applied in microteachings on prospective teachers' web pedagogical content knowledge and teacher self-efficacy, and to examine their views on the procedure. This research used mixed research design and was conducted with 24 prospective teachers who participated in teacher training certificate program in Faculty of Education in a state university in Turkey. Web pedagogical content knowledge scale, teacher self-efficacy scale, and an open-ended question form were used as data collection tools. Paired samples t-test and Pearson correlation analysis were applied for the analysis of quantitative data; content analysis was used to analyze the qualitative data. The findings showed that there was a significant difference on prospective teachers' web pedagogical content knowledge and teacher self-efficacy levels after Web 2.0 tools implementation. The research also concluded that there was a medium level positive relation between teacher candidates' web pedagogical content knowledge and teacher self-efficacy. They stated that it was easy to use these tools, learning was fun, easy, and permanent, and they actively involved in instructional time. They added that they were eager to apply Web 2.0 tools in their future classrooms.

Keywords: microteaching, web 2.0 tools, web pedagogical content knowledge, teacher self-efficacy

1. Introduction

In our present world, policy makers and educationalists see the technology as a key tool for solving problems in an education system and so that the classrooms are being equipped with new technologies (Akcaoglu, Gumus, Bellibas, & Boyer, 2015). The pressure on teachers expected to use these new technologies has been increasing, and prospective teachers' training to use these technologies in future has come to topic (Tondeur et al., 2012; Tsai & Chai, 2012). In this study, microteaching method with Web 2.0 tools, which is an effective way to contribute to prospective teachers' training, was focused.

1.1. Microteachings

It has been remarkably highlighted that prospective teachers should experience microteachings so as to apply technology in their future classrooms effectively (Cavin, 2008; Ertmer & Ottenbreit-Leftwich, 2010). With microteachings, it is aimed to bring prospective teachers critical teacher behaviors that are determined beforehand. In this method, the

number of the students and the instructional time are decreased, and teaching activities are increased (Görgen, 2003). According to Çoban (2015), generally, microteaching method is a teaching experience which is comprehensive and in which it is revised and reevaluated. Microteachings are the first steps prospective teachers to make before they face with real classroom teachings. These teachings are of key procedures to guide prospective teachers to determine their course objectives, to design their instructional methods, to select their materials, to maintain a course hour, and to provide feedback for their own teachings.

1.2. Self-Efficacy

Self-efficacy issue has been brought forth in technology integration in education in many studies (Curts, Tanguma, & Peña, 2008; Niederhauser & Perkmen, 2008). As these researchers highlight, teachers' context and technology knowledge increase simultaneously with technology-integrated instructions, therefore, teachers gain more confidence to adapt and use technology professionally. Meanwhile, self-efficacy is explained by Bandura (1977) mostly as individuals' beliefs shaped by their own motivation, affection, interaction, models and many other dynamics. Self-efficacy for a teacher is a way of fulfilling a duty in a specific environment and obtaining an outcome as a conclusion (Bandura, 1986). To sum up, teachers' self-efficacy affects their way of instruction through their skills, habits and competencies. Regarding self-efficacy, teachers can feel more confident to maintain a process on internet and digital world. Besides cherished with high self-efficacy, teachers' motivation is likely to increase in interacting with internet and its agents (Horzum, 2011).

1.3. Web 2.0 Tools

Tim O'Reilly first introduced the concept of Web 2.0 in 2004 (O'Reilly, 2007). Though there has not been a consensus on the clear definition of Web 2.0, it is widely accepted that there is a transition from Web 1.0, which is a solely read-only web, to a new era in which web can be read-written thanks to Web 2.0 and that the users' role has been modified (Hew & Cheung, 2013). In Web 2.0 era, individuals who were passive users in Web 1.0 era have become active participants of information and individual or collaborative producers of content (Brown, 2012; Hew & Cheung, 2013; Solomon & Schrum, 2007). The change in users' roles has resulted from Web 2.0 tools.

Web 2.0 tools are of the easiest agents of digital world to apply in education (Kurilovas & Juskeviciene, 2015). Students of our age benefit from these tools' free of charge, easiness to use (Churchill, 2011), being user-friendly, promoter of learning anywhere-anytime, and so these tools encourage individual and/or collaborative learning and production (Brown, 2012; Hartshorne & Ajjan, 2009). These technologies remarkably take turns on education. As students utilize, teachers also take advantage of Web 2.0 tools. They can share their experiences and ideas on a specific topic with their colleagues all around the world. It is feasible to follow a further educational career, webinars, workshops, or any applicable lectures. On the other hand, these tools can provide teachers with instructional strategies, activities, materials, assessment alternatives, shared platforms for students, or any applications that can be handy in classrooms. In addition to these tangible contributions, teachers can foster inner qualities as well.

Studies (Laru, Näykki, & Järvelä, 2012; Meyer, 2010) have presented different results that Web 2.0 tools have contributed to learners and individuals' different needs. These results showed that Web 2.0 tools have increased collaboration, effective decision-making and individual knowledge acquisition through interactive participation. Besides, individuals' Web 2.0 tools knowledge and their intention to apply were found to be affected highly by their preferred learning styles, beliefs about worthiness of these technologies for improving, access

characteristics, and satisfaction (Chen, Yen, & Hwang, 2012; Kurilovas & Juskeviciene, 2015; Sadaf, Newby, & Ertmer, 2012).

1.4. Web 2.0 Tools and Teacher Education

The International Society for Technology in Education (ISTE, 2016) has embarked on digital citizens to be raised that can use internet and digital tools effectively and appropriately in order for getting prepared for the uncertain future conditions. Similarly, Kumar & Vigil (2011) have emphasized that 21st century teachers are to produce digital content and integrate it with K-12 students in learning activities. Therefore, teachers are expected to have digital qualifications in order to apply Web 2.0 tools effectively in their classrooms (Sadaf, Newby, & Ertmer, 2012; Solomon & Schrum, 2007).

Kumar & Virgil (2011) have come into conclusion that present prospective teachers with high digital skills will not be able to transfer these skills into their future classrooms. One of the reasons presented in the same study is that prospective teachers are not individually able to bridge technology, pedagogy, and content knowledge. Additionally, similar research findings have indicated that prospective teachers are not well trained to apply Web 2.0 tools for effective instructional purposes (Lei, 2009; Kumar & Vigil, 2011). These results show that there is a need for frameworks in which technology, pedagogy, and content knowledge can be integrated.

In order to equip prospective teachers with digital skills, it is widely known and accepted that Technological Pedagogical and Content Knowledge (TPACK) competencies are more than necessary. Studies regarding TPACK competencies for present and future world have been on the front burner so far (Harris & Hofer, 2011; Koehler & Mishra, 2005). These studies have indicated that teacher-training programs should not be separated from TPACK skills and the present students in these programs have been widely surveyed for the issue. The common view states that TPACK is one of the expected and required competency for a teacher-to-be. However, different from common technologies, Web 2.0 tools have different technologies to be known. There needs to be different concentration for Web 2.0 tools to be actively used and benefited. Therefore, Web Pedagogical Content Knowledge (W-PCK) framework that was built upon PCK (Shulman, 1986) and TPACK (Mishra & Koehler, 2006) by Lee & Tsai (2010) to effectively use Web 2.0 tools specifically.

W-PCK framework consists of three knowledge fields; Content (C), Pedagogy (P) and Web (W). According to Lee & Tsai (2010), Web knowledge covers the use of both related tools and the their functions for communication or interaction. Content knowledge covers relevant subject area. Pedagogical knowledge covers teaching and learning processes and practices or methods applied in the processes. As seen in Figure 1, the W-PCK framework consists of four components, resulting in interaction between Content, Pedagogy and Web. Pedagogical Content Knowledge (PCK) contains pedagogical knowledge appropriate for the content. Web Content Knowledge (WCK) includes the use of Web tools that are specific to the subject area. Web Pedagogy Knowledge (WPK), includes the use of Web tools in pedagogical patterns. Web Pedagogical Content Knowledge (WPCK) involves the use of appropriate pedagogical patterns and Web tools in the teaching of the subject area.
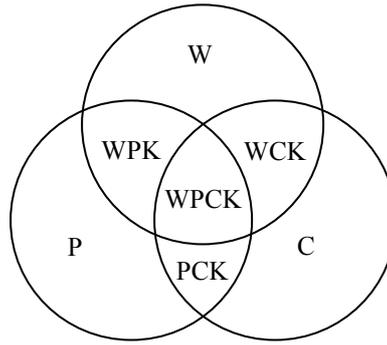
Figure 1. Web Pedagogical Content Knowledge (Lee & Tsai, 2010)

There are studies (Akgün, 2013; Arabacıoğlu & Dursun, 2015; Gömleksiz & Fidan, 2011; Kavanoz, Yüksel, & Özcan, 2015) basically describing pre-service teachers' W-PCK and their differences regarding age, gender, department, and additionally regarding self-efficacy. For a prospective teacher, it is important to have W-PCK competencies during training. Additionally, teacher training programs concern microteachings sincerely. They are one of the most effective methods in teacher training to foster prospective teachers to practice what they have learned so far and present their teaching skills. During the integration of Web 2.0 tools application in microteachings, a question appears: Is it possible to upskill prospective teachers both with teaching confidence and effective use of Web 2.0 tools in microteaching? The answer is not known for sure yet. With this perspective, this study investigates whether Web 2.0 tools applied in microteachings have an effect on prospective teachers W-PCK and teacher self-efficacy. Therefore, the questions below were tried to be answered:

- Does applying Web 2.0 tools in microteaching affect prospective teachers' W-PCK self-efficacies?
- Does applying Web 2.0 tools in microteaching affect prospective teachers' teacher self-efficacies?
- Is there any relationship between prospective teachers' W-PCK and teacher self-efficacies?
- What are the opinions of prospective teachers on applying Web 2.0 tools in microteaching?

2. Method

2.1. Research Design

The study was conducted in converging design of mixed method. As Creswell & Plano Clark (2011) stated, in this method, the qualitative and quantitative data were collected and analyzed at the same time. The equal priority of both data were gathered in interpretation section. Therefore, the quantitative data and qualitative data results supported one another.

The quantitative part of the study was conducted on single group pre-test/post-test quasi-experimental design. The independent variable of the study was effective Web 2.0 tools implementation in microteaching. The dependent variables of the study were prospective teachers' W-PCK and teacher self-efficacy. The scores of W-PCK self-efficacy were gathered through the "Web Pedagogical Content Knowledge Scale" and of teacher self-efficacy were gathered through the "Teacher Self-Efficacy Scale". After the seven-week

experimental process, the qualitative part of the research, were gathered through open ended question form consisting of prospective teachers' opinions on Web 2.0 tools. The design of the study was presented in Table 1.

Table 1. *Design of the study*

N	Pre-test	Treatment (7 weeks)	Post-test
24	W-PCK & Teacher self-efficacy	T	W-PCK & Teacher self-efficacy Open-ended question form

2.2. Participants

The study was conducted with 24 Tourism and Hotel Management Department students who participated in teacher training certificate program in Faculty of Education in a state university in Turkey. Of the 24 students, there were 10 females and 14 males. Participants' ages ranged from 22 to 30 years. The convenience sampling method was used in selecting the participants. In convenience sampling that is commonly used in both quantitative and qualitative studies, participants are selected because of their accessibility or convenience (Yıldırım & Şimşek, 2013). The participants received the treatment during course weeks and there did not exist any compelling force of the instructor on the participants due to the nature of the academic flow. They were also informed about the study beforehand and they voluntarily participated.

2.3. Context and Process

During the course maintenance, the instructor as the first researcher followed a sequence for an instructional design that is commonly known as ADDIE (analyze, design, develop, implement, evaluate) model. The instructor directed prospective teachers to follow this sequence while deciding their materials and matching them with purposes. The course was completed in 7 weeks in total, with 8 hours in each week. While selecting Web 2.0 tools, microteaching procedure and the application appropriateness were taken into consideration. In order for preservice teachers to prepare effective and attractive presentations with microteachings, Prezi; to prepare concept maps, Bubbl.us; to involve all students in evaluation process and determine learning gaps, game based Kahoot! and Puzzlemaker; and to share all the content, Edmodo tools were selected. The content of the course is presented in Table 2.

Table 2. *Content of the course*

	Duration	Content	Outcomes
Week 1	4	Introduction, pre-tests Identify instructional goals	Instructional goals Content Analysis report
	4	Task-job-goal analysis Learner analysis Instructional analysis	
Week 2	4	Writing performance objectives Developing assessment instruments	Instructional objectives Assessment instruments
	4	Developing instructional strategies Developing lesson plans	Lesson plans Design report
Week 3	4	Using Web 2.0 tools	Instructional materials

	4	Using Web 2.0 tools and developing instructional materials			
Week 4	4	Using Web 2.0 tools and developing instructional materials	Instructional materials		
	4	Microteaching	Feedback and revising instruction		
Week 5 **Week 6**	4	Microteaching	Feedback and revising instruction		
Week 7	4	Microteaching	Feedback and revising instruction		

2.4. Data Collection Tools

For the quantitative data collection, "Web Pedagogical Content Knowledge (W-PCK) Scale" and "Teacher Self-Efficacy Scale" were applied. W-PCK scale, which was developed by Lee & Tsai (2010), and adopted into Turkish by Horzum (2011), has five sub-dimensions namely *web-general, web-communication, web-content knowledge, web-pedagogical content knowledge, and attitudes towards web-based instruction*. The Cronbach alpha level of the scale was determined as .94. In this study, the alpha level was found as .91. The "Teacher Self-Efficacy Scale" which was developed by Tschannen-Moran & Hoy (2001) and adopted into Turkish by Çapa, Çakıroğlu, & Sarıkaya (2005) has three factors namely *increasing student participation, using instructional strategies, and classroom management*. The Cronbach alpha level of the scale was determined as .93. In this study, the alpha level of the scale was found as .96.

For the qualitative data collection, a structured form including four open ended questions were used. The form was developed by the researchers regarding related literature (Daher & Lazarevic, 2014; Davis, 1989; Sadaf, Newby, & Ertmer, 2012), in which participants can evaluate the course content, applied Web 2.0 tools, their personal and professional developments, and the researchers' professional experiences. After questions were formed, they were sent to three experts, one from Educational Sciences and two from Computer Education and Instructional Technologies, for their opinions. Regarding the feedback from experts, the form was revised and finalized for participants' responses. In the form, following questions were asked: *Have you ever had any difficulties while using Web 2.0 tools? If yes, with which tool? Was the course effective to provide you with teaching skills? Please explain how. What are your likes and dislikes about the course? Please explain why. Which Web 2.0 tools that you learnt during the course would you like to use primarily in your future classroom? Please explain why.*

2.5. Data Analysis

In the analysis of the quantitative data, to determine the difference between pre-test and post-test, paired samples t-test was utilized. Before analyses, normality of difference between pre and post-test scores of W-PCK and teacher self-efficacy scales were tested. According to the Shapiro–Wilk test, scores for difference between pre and post-test scores of W-PCK (p=.14) and teacher self-efficacy (p=.11) were distributed normally. In many studies (Alvarez, Brown, & Nussbaum, 2011; Laru, Näykki, & Järvelä, 2012; Lehiste, 2015), it has been observed that paired samples t-test, which is a parametric test, has been applied for small groups of 17 and 20 participants. Therefore, paired samples t-test was used to examine the differences between the pre-tests and the post-tests in this study. The SPSS 22.0 program was used for the data analysis. Regarding the significance level, the value of .05 was

considered. For the calculation of the effect size, the $\eta^2 = t^2 / (t^2 + (n - 1))$ equation was used (Büyüköztürk, 2015), while the following criteria for the values of η^2 (.01 small effect, .06 medium effect, .14 large effect) were considered for the effect size (Büyüköztürk, 2015). The post-test scores of W-PCK and Teacher Self-Efficacy scale were proved that the scores were normally distributed regarding Shapiro-Wilk test results found respectively as .29 and .06. Therefore, the relationship between scores of both scales were examined applying Pearson correlational analysis.

For the qualitative data analysis, content analysis was conducted (Miles & Huberman, 1994). In content analysis, it is aimed to combine similar data under themes and to present them so that readers can understand (Yıldırım & Şimşek, 2013). The induction approach was adopted when data analysis was conducted. Codes were generated by direct citation of the responses to the questions, and these codes were collected under certain themes. While presenting the data, only the themes were used to reflect the views of the participants. Frequencies were also indicated. The two researchers have conducted the coding process independently in creating codes and forming the themes in order to provide reliability. Inter-coder reliability was set through percentage agreement (95%). For further validity and reliability of the results in the research, the data were presented in details and direct quotations were witnesses as much as possible (Yıldırım & Şimşek, 2013).

3. Findings

3.1. Results of W-PCK Scale Scores

In order to examine the difference between pretest-posttest scores for the W-PCK scale, paired samples t-test was conducted. The t-test results were presented in Table 3. Based on t-test results, it was found that there was a significant difference between participants' pre-posttests scores. The prospective teachers as participants who took course with Web 2.0 tools for the instructional purposes showed increase in their scores. The results of participants according to W-PCK scale's sub dimension were found as for web-general t(23)=3.43, p<.05; web-communication t(23)=2.51, p<.05; web-content knowledge t(23)=3.51, p<.05; web-pedagogical content knowledge t(23)=5.44, p<.05; and attitudes towards web-based instruction t(23)=7.16, p<.05; and as for the total scale scores t(23)=7.16, p<.05. The effect sizes of web-general (.34), web-communication (.22), web-content knowledge (.35), attitudes towards web-based instruction (.41), web-pedagogical content knowledge (.56), and total scale scores (.69) were found as large level. These results show that the course with its implementations have had an important effect size on participants' W-PCK. Additionally, it can be assumed that prospective teacher might get familiar with the course content and the technology-integrated instructions therefore, their W-PCK scores might increase.

Table 3. *T-test results of W-PCK Scale*

	Measurement	N	X	S	df	*t*	*p*	η^2
Web-General	Pretest	24	32.50	2.73	23	3.43	*0.00*	0.34
	Posttest	24	33.96	1.71				
Web-Communication	Pretest	24	18.21	2.38	23	2.51	*0.02*	0.22
	Posttest	24	19.21	1.53				
Web-Content Knowledge	Pretest	24	22.29	2.29	23	3.51	*0.00*	0.35
	Posttest	24	24.00	1.79				
Web-Pedagogical	Pretest	24	33.63	4.26	23	5.44	*0.00*	0.56

Content Knowledge	Posttest	24	37.63	2.65			
Attitudes towards Web-based Instruction	Pretest	24	25.75	3.35	23	3.99	*0.00*	0.41
	Posttest	24	29.67	5.04			
Total Scale	Pretest	24	132.38	11.02	23	7.16	*0.00*	0.69
	Posttest	24	144.46	9.17			

3.2. Results of Teacher Self-Efficacy Scale Scores

In order to examine the difference between pretest-posttest scores for the self-efficacy scale, paired samples t-test was conducted. The t-test results were presented in Table 4. The results showed that there was a significant difference between participants' pretest-posttest scores. The implementations were significant for the ensuring students participation $t(23)=4.43$, $p<.05$, applying instructional strategies $t(23)=5.23$, $p<.05$ and classroom management $t(23)=3.72$, $p<.05$ sub dimensions and for the total scale scores $t(23)=4.91$, $p<.05$. The effect sizes for ensuring students' participation (.46), classroom management (.37), applying instructional strategies (.54), and total scale (.51) were found as large level. These results show that the course with its implementations have had an important effect size on participants' teacher self-efficacy.

Table 4. *T-test results of Teacher Self-Efficacy Scale*

	Measurement	N	X	S	df	*t*	*p*	η^2
Ensuring Students Participation	Pretest	24	52.96	2.73	23	4.43	*0.00*	0.46
	Posttest	24	59.46	1.71			
Applying Instructional Strategies	Pretest	24	53.08	2.38	23	5.23	*0.02*	0.54
	Posttest	24	61.50	1.53			
Classroom Management	Pretest	24	55.08	2.29	23	3.72	*0.00*	0.37
	Posttest	24	60.58	1.79			
Total Scale	Pretest	24	161.13	4.26	23	4.91	*0.00*	0.51
	Posttest	24	181.54	2.65			

3.3. The Relation between Prospective Teachers' W-PCK and Self-Efficacy Perceptions

Descriptive findings and correlation coefficient for the W-PCK and teacher self-efficacy post-test scores of the prospective teachers were presented in Table 5. As the result of the examination, it was found that there was a medium level positive relation ($r=.502$, $p<.05$) between W-PCK and teacher self-efficacy scores. It can be interpreted as that W-PCK self-efficacy increase; teacher self-efficacy perceptions increase as well. When the determination coefficient ($r^2=0.25$) was taken into consideration, it can be commented that 25% of the total variance in prospective teachers' self-efficacies can be explained with W-PCK.

Table 5. *W-PCK and Teacher Self-Efficacy Scales' descriptive results and correlational coefficients*

Variables	X	S	1	2
1- TAPCK-W	144.46	9.17	1	
2- Teacher self-efficacy	181.54	21.50	.502[*]	1

[*]*p<.05, n=24*

3.4. Prospective Teachers' Views On

3.4.1. Web 2.0 tools

Prospective teachers mostly responded positively for the Web 2.0 tools and their application level. Most of them responded as they did not have any difficulty in applying tools, and the rest responded as they had minor problems in applying the tools in the beginning, but then adapted quickly. The themes were determined as *no difficulty in applying tools* and *minor difficulties at the first application*. The sample responses were presented in Table 6. below.

Table 6. *Themes and sample responses on web 2.0 tools*

Themes	Sample Responses
No difficulty in applying tools (10)	*"All the applications were easy and simple."* *"I did not have any difficulty."* *"All the applications were clear and easy to understand."*
Minor difficulties at the first application (10)	*"When I first used the application, I had some minor problems. Then I realized how enjoyable the tools were and I started to use without any problem." "When I first used Prezi, I found it hard. Then I got used and quickly applied."*

3.4.2. The course

Prospective teachers reflected positive attitudes towards course period they had experienced. They mostly focused on their developed skills and competencies for technology integration in instruction and professional confidence. These responses were formed under four themes namely, *developed technology use skills, teaching skills, active participation in course period*, and *review chances for incompetency*. Sample responses for the related themes were presented in Table 7.

Table 7. *Themes and sample responses on the course*

Themes	Sample Responses
Developed technology use skills (16)	*"We have learned many web tools and how to apply these tools in instruction."* *"It helped us to decide which web tools we could apply and how to do it."*
Developed teaching skills (12)	*"I have had many presentations but they were only Power Point slides. The tools I learned through this course contributed to my presentation skills a lot. I am sure that my teaching life will continue with joy and my students will have fun in courses."* *"Thanks to practices we performed we overcome our anxiety and had experiences."* *"We have learned instructional flow and how to manage the instructional time thanks to microteachings."*
Active participation in course period (7)	*"It was a complete student friendly course so that we all had great time while learning."* *"While learning and using web tools, the whole class actively involved."*
Review chances for incompetency (2)	*"The feedbacks when we made a mistake helped us to review and correct ourselves."*

3.4.3. The course likes and dislikes

Prospective teachers stated that they enjoyed the fact that they were actively participating, finding opportunities to teach, using Web 2.0 tools, seeing the instructor as a model, earning self-confidence, and achieving permanent learning thanks to the course they took. The themes were determined as *active participation, lecturing, using web 2.0 tools, instructor as a model, higher self-confidence,* and *realization of permanent learning*. Prospective teachers stated that they liked the procedure of the course. The sample responses with related themes were presented in Table 8.

Prospective teachers only stated that they did not like the duration of the lecture as a dislike. The responses were recorded as, *"The only thing I did not like is that the presentations' duration were very short.", "The given time for the presentations were too short.", "Since microteaching duration was very short, we rushed."*

Table 8. *Themes and sample responses on course likes*

Themes	Sample Responses
Active participation (4)	*"The fact that we actively participated in the course and learned many new things were what I liked most."* *"It was a very effective experience to actively involved in the course with microteachings."*
Lecturing (4)	*"To prepare for the lesson individually, to come here and teach like a teacher was very productive."* *"For the first time I taught in a planned way without memorization. This is what I liked."*

Using web 2.0 tools (4)	*"I have learned many web tools that I liked and they will help me in the future."* *"This was a very productive period I think I have learned to use the technology more usefully."*
Instructor as a model (3)	*"It is a fact that the instructor practiced everything he taught in his own lesson was very effective."* *"I liked the fact that the instructor's being model for us about the use of technology."* *"I would like to apply my own model of this lesson to my students in order to achieve high levels of achievement in the same way when I become a teacher."*
Higher self-confidence (2)	*"I liked that my self-confidence increased in the course."* *"My self-confidence developed. That's what I liked."*
Realization of permanent learning (1)	*"I am delighted that I still have not forgotten what I learned."*

3.4.4. The web 2.0 tools for future classrooms

Prospective teachers were found very willing to use web tools in their future classrooms. They mostly stated that they were tend to use Kahoot and Prezi, which were of the introduced tools in the course. They responded positively for Kahoot *(14)*, Prezi *(13)*, Bubbl.us *(8)*, and Edmodo *(7)* applications as, *"Kahoot is very enjoyable and informative.", "With Kahoot, the courses can be more fun and meaningful through using post exercises at the end of class hours.", "I will use Prezi to present attentive visual presentations for my students.", "I plan to use Prezi in presentation section of the course.", "With Bubbl.us, I can use concept maps since it helps to present the issue simply for the students.", "To form concept maps is easy and saves time.", "For the communication with students, I will apply Edmodo.", "To share materials, homework, and exercises, I will apply Edmodo."*

4. Results and Discussion

Regarding the study results, it was noticed that the microteachings and the applied Web 2.0 tools during the course procedure have changed both prospective teachers' W-PCK and Self-Efficacy scale scores significantly. The effect sizes on both W-PCK and Self-Efficacy scores were found important to report that implementations during the course procedure were effective. The medium level relation between W-PCK and Self-Efficacy results also showed that their scores increased simultaneously, which explains that the more prospective teachers engage in acquaintance and competence with web tools the more they increase in self-efficacy.

As observed in findings above, effective use of Web 2.0 tools in microteaching affected prospective teachers' W-PCK and self-efficacy. Additionally, their own participation and motivation were positively influenced by these tools by means of applying them individually in microteachings. The scale scores and responses showed that Web 2.0 tools broadened new horizons for future teachers.

Additionally, the views of prospective teachers on Web 2.0 tools, the course, likes and dislikes, and plans for future classrooms presented further implications for the implementations. The views on Web 2.0 tools have presented that adaptation in technology for instructional purposes may not be so difficult to manage. Therefore, the prejudices such as fear of loss of time to figure out on knowing, selecting, and adapting the right Web 2.0 tool for instructional purposes can be eliminated before future teachers start their own

implementations. The views on the course in general have presented that prospective teachers have had the opportunity for developing technology skills and therefore teaching skills at the same time, which also have resulted in active participation and immediate feedbacks. Followingly, prospective teachers commented on the course procedure by evaluating it in different ways. They have mentioned that the course itself with implementations created a joyful and informative atmosphere. With the microteachings conducted during the course with the modelling of the instructor have made what has been learnt more permanent and meaningful. The prospective teachers in the study also shared their opinions on future classroom implementations by referring the Web 2.0 tools that were used in the course. Therefore, it is likely to say that they are willing to apply similar or same web tools in their future classrooms effectively.

First of all, accepting that Web 2.0 tools are pedagogically meaningful, prospective teachers reflected high tendency to transfer these tools into their real classroom teachings. However, it can be said that modelling teachers with such instructional technologies is also of great importance. Utami & Nafi'ah (2016) stress in their study that prospective teachers as observers in a course flow can gain many experiences from microteachings and their being modelled. Therefore, in pre-service programs, instructors should be encouraged to stimulate purposeful technologies regarding departments, course subjects, classroom dynamics and many other teacher/student based variables. Furthermore, upskilling prospective teachers with current competencies and frequently used either personally or collaboratively Web 2.0 tools influenced their self-efficacy as observed in similar studies (Curts et al., 2008; Niederhauser & Perkmen, 2008). In addition, Kavanoz, Yüksel, & Özcan (2015) and Akgun (2013) have stated that there is a positive correlation between web pedagogical knowledge and self-efficacy of pre-service teachers as similar to this study's findings. In this study, it was found that the prospective teachers had a meaningful relationship between W-PCK and teacher self-efficacy. This result indicated that 25% of the total variance in prospective teachers' self-efficacies can be explained with W-PCK also. It shows that teacher self-efficacy can be increased by enhancing W-PCK competencies of teachers. As mentioned, Web 2.0 tools can be applied to enhance this bound of pre-service teachers for their further competencies in technology and instruction.

The study also emphasized that monotonous presentation of Web 2.0 tools by an instructor/trainer might not solely be enough to advance teaching skills. It is also necessary to give opportunity for pre-service teachers to try to design their own teaching flow with presented tools appropriate for their purposes in a theoretical framework. Mannathoko (2013) embarks that insufficient assistance and implementations before teaching practice in real school environment negatively affects school practice of prospective teachers who need more practice before the real start. Therefore, the hot crisis "the gap between theory and practice" can be closed smoothly. That is why microteachings should not be disregarded if the issue is teacher training.

Many researchers have reported that teachers' attitudes towards technology use are highly affected by the perceived benefits of technology and ease of use (Davis, 1989; Sadaf, Newby & Ertmer, 2012; Teo, Lee & Chai, 2008). In other words, when teachers develop a perception that the new technology offered to them facilitates access to instructional objectives and is easy to use, it affects their attitudes towards technology, and following their attitudes affect technology use behaviors (Davis, 1989). The results of the research on prospective teachers' views on Web 2.0 tools reveal that prospective teachers have a perception that Web 2.0 tools are easy to use and pedagogically meaningful. Positive perceptions, when the attitude sub-dimension of the W-PCK scale is evaluated together, have turned into positive attitude. This

indicates that prospective teachers can use Web 2.0 tools in their classes. Prospective teachers' views also show that they are willing to use Web 2.0 tools in their future classes.

The study results in general highlighted that technology integration is more effective when it is profoundly designed and introduced. Requiring from teachers to be active users of any technology agent in classroom environment may not be convincing and operative all the time since it depends on many different dynamics. In order for teachers to actively and effectively use of technology tools in different educational purposes there needs an intersection of knowing the technology tools that will be applied, transferring them into content, and relating them with a meaningful outcome and learning (Angeli & Valanies, 2009). That is, after introducing teachers with any technology tool and presenting the reason, instructional purpose and practice opportunity tend to be more attentive and facilitative. Therefore, as it was implemented in the study, it is better to inform and train pre-service teachers and/or in-service teachers not with a random technology-based tool, but instead with goal-oriented technology tools.

Technology integration in education is both complicated and difficult as a process. There are first and second obstacles to overcome (Ertmer, 1999, 2005; Hew & Brush, 2007). A third type of obstacle is teacher education (Tsai & Chai, 2012). One of the most effective methods used for teacher education is microteaching method. It is inevitable that the microteaching method should be updated to include the use of modern technologies. These research results, which focus on the use of Web 2.0 tools in the microteaching methodology, have showed that the correct use of Web 2.0 tools in microteaching has significantly increased the W-PCK and teacher self-efficacy of prospective teachers. Correct use has the following steps: a combination of an instructional design model such as the ADDIE model and the W-PCK framework; Instructor's modeling for prospective teachers by thinking aloud how Web 2.0 tools are used in what stage, for what purpose and how; Prospective teachers have their own stages of making their own teaching designs.

As final words, the study has answered that it is possible to affect prospective teacher' W-PCK and teacher self-efficacy by using Web 2.0 tools and practicing them in microteachings. However, the point proposed by the study is that describing and presenting these tools may not be a reinforce for prospective teachers who are supposed to be the users and transponders of these tools. It has been seen that prospective teachers will tend to more eager and curious to apply these tools when they are explained which tools is more appropriate for which part of an instructional period and how they can use it for an effective teaching.

The results of the research provide important implications for decision makers and educators. In the case of correct use of Web 2.0 tools in micro-education, W-PCK and teacher self-efficacy of prospective teachers can develop, prospective teachers can develop positive attitude towards Web 2.0 tools and may become willing to use these technologies in their class in the future. The applied education can contribute to the teachers training in terms both of their self-confident and of technology use. For this reason, curricula used in teacher education can be updated to include microteaching practices that allow the use of Web 2.0 tools.

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