PRESERVICE MATHEMATICS TEACHERS' VIEWS ON DISTANCE EDUCATION AND THEIR WEB PEDAGOGICAL CONTENT KNOWLEDGE

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ABSTRACT

This research aims to investigate primary preservice mathematics teachers' views on distance education and web pedagogical content knowledge in terms of the subscales of general web, communicative web, pedagogical web, web pedagogical content and attitude towards web based instruction. The research was conducted with 46 senior students in the department of Primary Mathematics Education in Istanbul. Web Pedagogical Content Knowledge scale developed by Lee, Tsai and Chang (2008) and adapted into Turkish by Horzum (2011) was used as the data collection tool. Values of frequency and percentage and Kruskal Wallis test were used in the analysis of the data. Whether preservice teachers' perceptions towards adequacy levels for web pedagogical content knowledge differ or not was discussed in terms of their views on distance education and their habits of using the Internet and e-mail.

Keywords: **Distance education, web pedagogical content knowledge, primary preservice mathematics teachers, internet, Email**

INTRODUCTION

Today distance education is being adopted in various fields. Distance education offers a faster and easier access to knowledge from primary to postgraduate levels. Thus, learners find an opportunity to study their learning materials in a deeper and wider way. Distance education also expands and deepens the process of learning and teaching due to the active engagement of information sources.

As suggested by Antalyalı (2004), distance education is a form of education in which students and teachers are in interaction in a virtual class environment thanks to various technologies. "Techological improvements such as printing machines, postal services, telephone, radio, television, and the Internet have been a driving force yielding new delivery methods and platforms" (Shachar and Neumann, 2003) and distance education is a form of education developed by using these means of technology.

Distance education is a wide-ranging concept due to the absence of constraints regarding the communication environment between parties.

When today's distance education activities are analysed, it is observed that Internet-based systems have been used intensively as an environment of communication. There emerged several concepts due to the possibility of distance education via the Internet technology. These concepts include e-learning, Web-based learning, Web-based instruction, Internet-based training, distributed learning, online learning and mobile learning (Uzun, 2008).

Web use is inevitable for individuals who are thinking of doing distance education in the process of learning and teaching. As suggested by Uzun (2008), web is a service that encompasses pages with information and runs through the Internet. Web and the Internet are used interchangeably as all the information on the Internet is provided by means of this service. With the integration of internet technology into the classroom environment due to the popularity of the terms of Internet and Web, Web use for educational purposes has gained importance (Yiğit, Yıldırım and Özden, 2000). In this context, it is necessary for instructors to be equipped with sufficient web pedagogy in order to conceptualize the learning materials transmitted to learners through web. Today there is a transformation from technology focused models to pedagogy focused models. As suggested by Yurdakul (2011), technology focused models aim to enable teachers to acquire the knowledge and skills regarding the use of technology whereas pedagogy focused models aim to enable teachers to relate their technological knowledge to their pedagogical knowledge in the process of teaching. For this reason, it is important to bring about learning approaches in which web; pedagogy and content are in interaction (Gömleksiz and Fidan, 2011).

When teachers' education is analysed, it is observed that the focus is primarily on content knowledge (Shulman, 1986). Content knowledge is a subject matter which is to be learned and taught and refers to the knowledge that teachers possess regarding the content to be taught (Harris and et al., 2007; Koehler and Mishra, 2005). Pedagogical knowledge, on the other hand, refers to the knowledge of practices, processes, strategies, procedures and learning-teaching methods (Mishra and Koehler, 2006; Koehler and Mishra, 2005). Pedagogical content knowledge, which was introduced by Shulman (1986), refers to teachers' way of teaching the field knowledge rather than their knowledge about the subject-matter.

The term Technological Pedagogical Content Knowledge was coined by Mishra and Koehler (2006) with the integration of technology into education and includes the knowledge of technology, techology literacy, use of technology in daily life, and knowledge of adapting to technological change (Schmidt and et al., 2009). The interplay between the components of content, pedagogy and technology forms the basis of education in an understanding of education of quality (Gömleksiz and Fidan, 2011).

With the integration of web technology into the teacher education programs, web use has become an important requirement since adequate technological pedagogical content knowledge cannot be ensured in teacher education (Lee, Tsai and Chang, 2008).

It is also necessary to structure the technological content knowledge of the Internet and Web differently since Internet/Web has features different from other technologies and its use includes some technologies (Horzum, 2011).

As a result, the term Web Pedagogical Content Knowledge was coined by Lee and Tsai (2010) and Lee, Tsai and Chang (2008). Web pedagogical content knowledge refers to the combination of web knowledge and pedagogical content knowledge teachers must have in order to use the Internet in education.

This combination includes four components, which are web knowledge, web content knowledge, web pedagogical knowledge and web pedagogical content knowledge (Lee and Tsai, 2010; Lee and et al., 2008). With the increase of web use in education, teachers' self-efficacy perceptions towards web-based instruction have gained importance. As is known, self-efficacy is "people's judgment of their capabilities to organize and execute the course of action required to attain designated types of performances" (Bandura, 1986).

Teachers' technological and internet self-efficacy and their self-beliefs towards the use of web and internet technologies in education influence the quality of education in a positive way. The increase in perceptions regarding self-efficacy towards distance education, course content and online technologies enhances the quality of web-based instruction (Horzum, 2011). There are not many research studies conducted in the literature with the aim of determining teachers' self-efficacy perception towards web-based instruction. Web pedagogical content knowledge scale is one of the best scales developed in relation to teachers' self-efficacy towards web-based instruction. As suggested by Horzum (2011), although the scale was not used much except in the studies of development, the studies concerning technological pedagogical content knowledge have been increasing day by day. In this context, studies to be done with prospective teachers are important in order to identify the existing situation before it is too late.

Thus, it will be possible to provide the prospective teachers with the necessary education regarding web pedagogical content knowledge when they are still in the early stage of their career.

Mathematics education is a suitable field for the use of available technological sources and thus mathematical pedagogy and technology are two fields which should be integrated into each other (Öksüz and et al., 2009).

National Council of Teachers of Mathematics (NCTM) counts the use of technology in mathematics education as one of the standards and principles of school mathematics and includes the statement that "technology is essential in teaching and learning mathematics; it influences the mathematics that is taught and enhances students' learning" (NCTM, 2000). Technology is a requirement for teaching and learning mathematics.

Therefore, topics from various areas of mathematical practice should be selected and introduced to students with the help of computer technology and students should be provided with the desire of doing research in every area of mathematics. Instructors of mathematics should introduce the true nature of mathematics and create an environment which enhances learning and teaching of it with the help of technology (Nuriyev, Sevim, Berberler, 2007). In this context, prospective mathematics teachers are expected to master the knowledge of web technology and distance education.

In the light of the general facts, an educational process where distance education prevails is a matter of fact and therefore, teachers in the process of learning and teaching mathematics should acquire the necessary knowledge.As is known, people resist change and react against the innovations which they do not possess the skills to use. For teachers to realize the change in educational institutions first they should accept the change themselves and they should be informed about the develoments especially in computer technologies (Çelik and Bindak, 2005).

In this context, this research was conducted with the aim of investigating prospective mathematics teachers' views on distance education and their web pedagogical content knowledge. The research is thought to contribute to the literature.

AIM OF THE STUDY

The research aims to investigate primary preservice mathematics teachers' views on distance education and their web pedagogical content knowledge in terms of the subscales of general web, communicative web, pedagogical web, web pedagogical content and attitude towards web based instruction. In line with this aim, the following research subproblems were posited:

- What are primary preservice mathematics teachers' views on how learning is influenced when there is only distance education instead of traditional classroom education?
- How do primary preservice mathematics teachers evaluate distance education in response to efficient classroom education?
- How often do primary preservice mathematics teachers use the Internet and e-mail?
- Do their scores of Web Pedagogical Content Knowledge Scale differ in terms of their views on distance education and their habits of using the Internet and e-mail?

METHOD

In this research, survey (descriptive-survey) model was used. Survey model aims to describe the existing situation as it stands in the past or currently (Karasar, 2005).

Participants

The research was conducted with the senior students enrolled at the department of Primary Mathematics Education in Hasan Ali Yücel Education Faculty of Istanbul University during the fall semester of the 2011-2012 academic years. Since these students are seniors, they will be referred to as preservice teachers in the other steps of the research.

The research participants are composed of 46 students including 17 (37%) men and 29 (63%) female students.

Data Collection Tools

Five-point Likert type Web Pedagogical Content Knowledge Scale (with 30 items), which was developed by Lee, Tsai and Chang (2008) and adapted into Turkish by Horzum (2011), was used as a data colection tool. KMO (Kaiser-Meyer-Olkin) coefficient of the scale was calculated as 0.93. On the other hand, Bartlett's Test was calculated to be 10108,11 and this result was found to be significant at $p<0.000$ level.

According to the analysis, the scale resulted in five-factor structure as in the original scale. General web factor includes seven items (item no:1,2,3,4,5,6,7), communicative web factor includes four items (item no: 8,9,10,11), pedagogical web factor includes five items (item no: 12,13,14,15,16), web pedagogical content factor includes eight items (item no: 17,18,19,20,21,22,23,24), factor of attitude towards web-based education includes six items (item no: 25,26,27,28,29,30). Cronbach's Alpha reliability coefficient was found to be 0.94 for the whole scale. However, Cronbach's Alpha reliability coefficient was found to be 0.80 for this research.

Demographic information form was used in the study as another data collection tool. This form includes some survey questions similar to the ones in the research by Antalyalı (2004). The questions in the form are related to preservice teachers' evaluation of distance education and traditional classroom education. Besides, preservice teachers' habits of using the internet and e-mail were included.

Data Analysis

SPSS 19.0 package program was used for the statistical analyses of the data collected in line with the main aim of the research (Büyüköztürk, 2003). Values of frequency and percentage and Kruskal Wallis test were used in the analysis of the data.

In case of a significant difference existing as a result of the Kruskall Wallis H test; Mann Whitney U test was carried out to find the source of the difference by doing binary combinations of the groups.

FINDINGS

The findings regarding the research problem and subproblems will be presented in this section. The first research problem is to answer the following question:

"What are primary preservice mathematics teachers' views on how learning is influenced when there is only distance education instead of traditional classroom education?" The findings regarding this data were given in Table: 1.

Table: 1
Values of Frequency and Percentage regarding preservice teachers' views on how learning is influenced when there is only distance education instead of traditional classroom education

	f	%
completely negative	8	17,4
partially negative	28	60,9
partially positive	9	19,6
completely positive	1	2,2
Total	46	100

As shown in Table: 1, among 46 primary preservice mathematics teachers in the research sample, 8 people (17,4%) answered "completely negative", 28 people (60,9%) answered "partially negative", 9 people (19,6%) answered "partially positive" and 1 person (2,2%) answered "completely positive" for the question "How is learning influenced when there is only distance education instead of traditional classroom education?"

The second research subproblem is to seek an answer for the following question: "How do primary preservice mathematics teachers evaluate distance education in response to traditional classroom education?" The data regarding this finding was given in tables 2 and 3.

Table: 2
How do you compare distance education to traditional classroom education?

	f	%
Very inefficient	7	15,2
Less efficient	32	69,6
Equally efficient	2	4,3
More efficient	4	8,7
Much more efficient	1	2,2
Total	46	100

As shown in Table: 2, of 46 primary preservice mathematics teachers, 7 people (15,2%) answered "very inefficient", 32 people (69,6%) answered "less efficient", 2 people (4,3%) answered "equally efficient", 4 people (8,7%) answered "more efficient", and 1 person (2,2%) answered "much more efficient" for the following question:

"How do you compare distance education to traditional classroom education?"

Table: 3
Which of the following is the best?

	f	%
Classroom education only	9	19,6
Distance education only	2	4,3
Classroom education and distance education together	35	76,1
Total	46	100

As shown in Table: 3, of 46 primary preservice mathematics teachers in the research sample, 9 people (19,6%) answered "classroom education only", 2 people (4,3%) answered "distance education only" and 35 people (76,1%) answered "classroom education and distance education together" for the following question: "Which of the following is the best?" The third research subproblem is to seek an answer for the question "How often do primary preservice mathematics teachers use the Internet and e-mail?" The data related to this finding was given in tables 4 and 5.

Table: 4
The Frequency of the Internet Use Among Preservice Teachers

	f	%
Less than once a week	5	10,9
Once a week	4	8,7
Several times a week	17	37,0
Every day	20	43,5
Total	46	100

As shown in Table: 4, of 46 primary preservice mathematics teachers in the research sample, 5 people (10,9%) answered "less than once a week", 4 people (8,7%) answered "once a week", 17 people (37%) answered "several times" and 20 people (43,5%) answered "every day" in terms of the frequency of Internet use.

Table: 5
The Frequency of E-mail Use Among Preservice Teachers

	f	%
Never	1	2,2
Less than once a week	8	17,4
Once a week	8	17,4
Several times a week	20	43,5
Every day	9	19,6
Total	46	100

As shown in Table: 5, of 46 primary preservice mathematics teachers in the research sample, 1 person (2,2%) answered "never", 8 people (17,4%) answered "less than once a week", 8 people (17,4%) answered "once a week", 20 people (43,5%) answered "several times a week", and 9 people (19,6%) answered "every day" in terms of the frequency of the e-mail use.

The last subproblem, which is also the core of the research, is to seek an answer for the following question: "Do preservice teachers' Web Pedagogical Content Knowledge scores differ according to their views on distance education and the frequency of Internet and e-mail use among them?" For this aim, first of all, it was analysed whether preservice teachers' Web Pedagogical Content Knowledge scores differ according to their answers for the question: "How do you compare distance education to the traditional classroom education?" Secondly, their scale scores were analysed to see whether they differ or not according to the variables of classroom education only, distance education only or classroom education and distance education together. The data regarding these findings were given in tables 6 and 7. The findings related to whether preservice teachers' scale scores differ according to the frequency of the Internet and E-mail use among teachers were given in tables 8 and 9.

Table: 6
The results of the Kruskal Wallis-H Test conducted to Determine Whether Web Pedagogical Content Knowledge Scale Scores Differ or Not In Terms of the variable of "How do you Compare Distance Education to The Traditional Classroom Education?"

Scores	Name of the Variable	N	Mean Rank	Chi-square	Sd	P
Web Pedagogical Content Knowledge	Much less efficient	7	22,57	10,196	4	,037
	Less efficient	32	26,23			
	Equally efficient	2	27,00			
	More efficient	4	6,75			
	Much more efficient	1	2,50			
	Total	46				

As shown in Table: 6, as a result of the non-parametric Kruskal Wallis-H test conducted to determine whether preservice teachers' Web Pedagogical Content Knowledge Scale scores differ significantly in terms of the question: "How do you compare distance education to the traditional classroom education?", there was a significant difference between the mean ranks of the groups. Later, the same test was performed with the other subfactors of the Web Pedagogical Content Knowledge Scale and significant difference was found with the subfactors of Pedagogical Web (x^2= 14,755, p< 0.05) and Attitude towards Web-based Instruction (x^2= 11,186, p<.05).

Complementary statistical methods were performed to find the source of significant difference between the groups. Since there is not a specific test technique for this purpose, binary comparisons were performed with the non-parametric Mann Whitney-U Analysis.

The prospective teachers who answered the question "How do you compare distance education to efficient classroom education?" as "less efficient" differed significantly in response to those who answered "more efficient" (z= -2,344, p<.05). Those who said "less efficient" differed significantly in response to those who said "more efficient" (z= -3,424, p<.05) in terms of the subfactor of Pedagogical Web.

Those who said "much less efficient" differed significantly in response to those who said "more efficient" (z= -2,103, p<.05). Those who said "much less efficient" differed significantly in response to those who said "more efficient" (z= -2,103,p<.05) in terms of the subfactor of Attitude towards Web based Instruction.

Table: 7
The results of the Kruskal Wallis-H Test Conducted to Determine Whether Web Pedagogical Content Knowledge Scale Scores Differ or Not In Terms of the Variable of "Classroom Education Only, Distance Education Only and Classroom Education And Distance Education Together"

Scores	Variable	N	Mean Rank	Chi-square	Sd	P
Web Pedagogical Content Knowledge	Classroom education only	9	20,06	6,739	4	,034
	Distance education only	2	1,75			
	Distance education and classroom education together	35	25,63			
	Total	46				

As shown in Table: 7, as a result of the non-parametric Kruskal Wallis-H Test conducted in order to determine preservice teachers' Web Pedagogical Content Knowledge Scale scores differ significantly or not in terms of the variable of "distance education only, classroom education only, and classroom education and distance education together," a statistically significant difference (x^2= 6,739, p<0.05) was identified among the mean ranks of the groups.

Later, when the test was conducted with the other subdimensions of the Web Pedagogical Content Knowledge Scale, a significant difference (x^2= 7,465, p<0.05) was determined with the pedagogical web subfactors.

Complementary statistical methods were performed to find the source of significant difference between the groups.

Since there is not a specific test technique for this purpose, binary comparisons were performed with the non-parametric Mann Whitney-U Analysis.

According to the total scale scores of the preservice teachers who answered the question "Which of these three forms was the most suitable?", those who said "classroom education only" differed significantly in response to those who said "distance education only" (z= -2,013, p<.05).

Those who said "distance education only" differed significantly in response to those who said "classroom education and distance education together" (z=-2,353, p<.05). In terms of the subdimension of pedagogical web, those who said "classroom education only" differed significantly in response to those who said "distance education only" (z=-2,313, p<.05.

Those who said "distance education only" differed significantly in response to those who said "classroom education and distance education together" (z=-2,451, p<.05).

Table: 8
The results of the Kruskal Wallis-H Test Conducted to Determine Whether Primary Preservice Mathematics Teachers' Web Pedagogical Content Knowledge Scale Scores Differ or Not In Terms of the Frequency of Internet Use

Scores	Variable	N	Mean Rank	Chi-square	Sd	P
Web Pedagogical Content Knowledge	Never	0	0	5,293	4	,152
	Less than once a week	5	23,70			
	Once a week	4	11,13			
	Several times a week	17	21,85			
	Every day	20	27,33			
	Total	46				

As shown in Table: 8, according to the non-parametric Kruskal Wallis-H test conducted to determine whether preservice teachers' web pedagogical content knowledge scale scores significantly differ or not in terms of the variable of the frequency of Internet use, there was not a statistically significant difference between the mean ranks of the groups (x^2= 5,293, p>0.05).

Later, when the non-parametric Kruskal Wallis-H test was conducted with the other subdimensions of Web Pedagogical Content Knowledge Scale, significant difference was found between the subfactors of Attitude Towards Web-based Instruction (x^2= -2,191, p<0.05).

Complementary statistical methods were performed to find the source of significant difference between the groups. Since there is not a specific test technique for this purpose, binary comparisons were performed with the non-parametric Mann Whitney-U Analysis. The participants who answered the question "How often do you use the Internet?" as "every day" differed significantly in response to those who answered "once a week" (z=-2,191, p<.05). Those who answered "every day" differed significantly in response to those who answered "several times a week" (z=-2,229, p<.05).

Table: 9
The Results of the Kruskal Wallis-H Test Conducted to Determine Whether Primary Preservice Mathematics Teachers' Web Pedagogical Content Knowledge Scale Scores Differ or Not In Terms of the Frequency of E-mail Use

Scores	Variable	N	Mean Rank	Chi-square	Sd	P
Web Pedagogical Content Knowledge	Never	1	2,50	9,429	4	,051
	Less than once a week	8	15,25			
	Once a week	8	20,69			
	Several times a week	20	25,38			
	Every day	9	31,50			
	Total	46				

As shown in Table: 9, according to the results of the non-parametric Kruskal Wallis-H Test conducted to determine whether preservice teachers' Web Pedagogical Content Knowledge Scale scores differ or not in terms of the frequency of e-mail use, there was not a statistically significant difference among the mean ranks of the groups (x^2= 9,429, p>0.05).

Later, when the test was performed with the other subdimensions of the Web Pedagogical Content Knowledge scale, there was a significant difference with the subfactors of Web Pedagogical Content (x^2= 11,650, p< 0.05) and Attitute Towards Web-based Instruction (x^2= 9,765, p< 0.05).

Complementary statistical methods were performed to find the source of significant difference between the groups. Since there is not a specific test technique for this purpose, binary comparisons were performed with the non-parametric Mann Whitney-U analysis. According to preservice teachers' subdimension of Web Pedagogical Content, those who answered the question related to e-mail use as "several times a week" differed in response to those who said "less than once a week" (z=-2,125, p<.05). Those who said "every day" differed in response to those who said "less than once a week" (z=-2,726, p<.05) and those who said "every day" differed in response to those who said "several times a week" (z=-2,102, p<.05). According to the subfactor of Attitude Towards Web-based Instruction, those who said "every day" differed significantly in response to those who said "less than once a week" (z=-2,299, p<.05). When the findings related to tables 8 and 9 were analysed, it was observed that Web Pedagogical Content and Attitude towards Web-based Instruction differed significantly among those who use the Internet and e-mail every day.

CONCLUSION AND DISCUSSION

According to the results of the findings, most of the participant preservice teachers stated that distance education instead of the traditional classroom education would influence learning negatively and distance learning would not be as efficient as classroom education. Notwithstanding, most of the participants thought distance education would be appropriate together with classroom education.

The research by Antalyalı (2004) also suggested that the participants' evaluations of distance education were usually negative. Students' criticism of distance education was not about the distance education itself, but the implementation of distance education on its own. They mostly argued for a model in which classroom education is supported by distance education.

According to primary preservice mathematics teachers' web pedagogical content knowledge scale scores, those who said "distance education was less efficient than the traditional classroom education" differed significantly in response to those who said "distance education was more efficient than the traditional classroom education".

According to the subdimension of pedagogical web, those who said "distance education was less efficient than classroom education" differed significantly in response to those who said "distance education was more efficient than classroom education." According to the subfactor of Attitude towards Web based Intruction, those who said "distance education was much less efficient than classroom education" differed significantly in response to those who said "distance education was more efficient."

Likewise, those who said "distance education was less efficient than classroom education" differed significantly in response to those who said "distance education was more efficient than classroom education."

On the other hand, according to the total scale scores and the subfactor of Pedagogical Web, those who said "classroom education only" were observed to differ in response to those who said "distance education only." Those who said "distance education only" differed in response to those who said "classroom education and distance education together."

When these findings were analysed, as suggested by Antalyalı (2004), the most efficient model was the one in which classroom education is supported by distance education. As suggested by Kaya et al. (2004), distance education is a method of teaching from a specific center in which interaction and communication are created and educational activities are delivered to students by means of specially prepared education units and various media when it is impossible to carry out in-class activities due to the insufficiency of conventional methods of teaching and learning.

In this context, it can be concluded that preservice teachers do not have sufficient knowledge about the practices regarding distance education. The subdimension of pedagogical content contains knowledge related to pedagogical practices and learning activities. It is a fact that preservice teachers should have the ability to fuse their knowledge of pedagogy with web technologies because nowadays education is based on the Internet and web (Horzum, 2011). As suggested by Gömleksiz and Fidan (2011), Chou and Tsai (2002) recommend teachers to work toward developing their curricula with limitless information from the web, study several websites and integrate the appropriate ones into instruction. Preservice teachers will have web pedagogical content sufficiency by integrating the web knowledge into their field-based and content knowledge.

Another finding of the research was that most preservice teachers were observed to use the Internet every day and several times a week. On the other hand, they use e-mail several times a week. According to the subfactor of Attitude towards Web-based Instruction, preservice teachers who answered the question "How often do you use the Internet?" as "every day" differed significantly in response to those who said "once a week." Those who said "every day" differed significantly in response to those who said "several times a week." In terms of the subdimension of web pedagogical content, it was observed that preservice teachers who answered the question related to e-mail use as "several times a week" differed significantly in response to those who said "less than once a week." Those who said "every day" differed significantly in response to those who said "once a week."According to the subfactor of web based Instruction, those who answered "every day" differed significantly in response to those who answered "less than once a week." Therefore, it can be concluded that web pedagogical content and attitude towards web-based instruction among those who use the Internet and e-mail everyday differ significantly. Thus, those who are more interested in computers and the Internet could be more positive about distance education.

According to the Spearman Brown test performed among the total scores of the scale used in the research and the scale dimensions, a positively significant relationship was found. However, while examining the research problems, there was not any significant difference in the scale subdimensions of general web and communicative web.

This could stem from the preservice teachers' assumption that distance education would be less efficient than classroom education.

Despite this, a significant differentiation could have been expected in the dimension of communicative web when preservice teachers' argument for classroom education supported by distance education is taken into consideration. On the other hand, the differences between pedagogical webs, web pedagogical content, attitude towards web based instruction might be due to the courses of education preservice teachers took. In the light of the findings briefly summarised above, the following suggestions can be made regarding the research and researchers:

- **This research is limited to the senior students enrolled at the department of Primary Mathematics Education in a faculty of education. However, further research can be conducted with students of other faculties of education. Similar research could be carried out in all grades and comparison between grades could be made.**
- **Qualitative research could be conducted comparing preservice teachers' views on distance education with the results of open-ended questions regarding communicative web, which is among the scale subdimensions.**
- **In this research preservice mathematics teachers' views on distance education were analysed in terms of web pedagogical content knowledge and their use of the Internet and e-mail. Other dimensions of distance education could be studied and prospective teachers could be informed about the results of these studies.**
- **Since an educational process where distance education prevails is a matter of fact, preservice teachers should be given training and seminars on distance education as soon as they attend to the faculty.**

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