

THE ATTITUDES AND OPINIONS OF PROSPECTIVE TEACHERS TOWARDS THE USE OF TECHNOLOGY IN EDUCATION¹

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ABSTRACT

This research, which aims to determine the attitudes and opinions of prospective teachers towards the use of technology in education, was conducted with the scope of exploratory sequential research design from mixed research models. The sample of the research consists of 216 prospective teachers, 143 females and 73 males, who take 'Use of Technology in Education' in the pedagogical formation certificate program within a state university in the academic year of 2018-2019. From this sample, 16 prospective teachers volunteered for the qualitative study group of the research. The data were collected from the participants by 'Personal Information Form,' 'Semi-Structured Interview Form,' and 'Attitude towards the Use of Technology' scale, which consists of 19 items. In the analysis of the research data, SPSS 25.0 package program and MaxQDA qualitative analysis program were used, and the data of the research were analyzed by using necessary statistical techniques. In the quantitative research, the attitudes of prospective teachers towards the use of technology in education were examined by the variables of their gender, age, education status, the department, faculty, and university they study. As a result of the research, it was determined that the attitude scores of prospective teachers towards the usage of education in technology were on the level of 'I Agree' and except for the variable of gender, there are significant differences in the attitude scores of prospective teachers according to their age, education status, the department, faculty, and university they study. When these differences are examined, it was determined that the differences were in favor of the 36-40 age group and graduates who have a bachelor of education. On the other hand, it was concluded that the attitude scores of prospective teachers towards the use of technology in education who were studying in the departments of Visual Arts, Imam-orator, Physics, Accounting, and Financing; in the faculties of Fine Arts and Theology and the universities of Yeditepe, Yıldız Technical, Ondokuz Mayıs, Mehmet Akif Ersoy and Atatürk were high. According to the qualitative results of the research; prospective teachers stated that technology should be used in education and that the benefits of using technology in education processes are more. They stated that prospective teachers would contribute to learning when technology is used responsibly, but negative consequences such as laziness, inefficiency of time, and dependence may occur when not paid attention. Finally; It is concluded that the connection between education and technology will continue to increase in the coming years and that the distance and virtual learning environments will be used more.

Keywords: Prospective teachers, use of technology in education, attitude, opinion.

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INTRODUCTION

The use of technology in educational activities has increased from past to present. The usage area, rate, purpose, and method of technology in education may differ in time. This situation is closely related to the period of change and improvement of technology. The expansion and the popularization of information and communication technologies (ICT), affect all fields of life and especially the field of education. In addition to the use of technology in everyday life, its usage increases in education as well (Martinovic and Zhang, 2012). Governments consider ICT as potential tools for change and innovation in education (Eurydice, 2001; Papanastasiou and Angeli, 2008). Technology policies are developed in education to actively use technology in educational institutions and provide the integration of information technology tools to education (Tekin and Polat, 2014). Turkey started the process of e-transformation as The Ministry of National Education with various projects that were conducted with the collaboration of World Bank since 1998 and started to be launched from the academic year of 2003-2004 (Cevik and Baloglu, 2007). In this context, FATİH (Movement of Enhancing Opportunities and Improving Technology) Project was launched as of the academic year of 2011-2012. Thus, it is considered to increase the quality of education and all of the students to benefit from the educational technologies in one way or another (Cuban, 2001; Dursun, Kirbas and Yuksel, 2015).

Education and technology are defined as the two essential tools that humans use to dominate their natural and social environment. While education serves humans to improve and develop the hidden and innate strengths and skills, technology helps to use the knowledge and skills that were obtained through education to be used more efficiently, consciously and systematically (Alkan, 2005). International Society for Technology in Education (ISTE) defines the accommodation of technology to education as technology to be accessible as other educational tools by including technology to the process and transforming it a part of processes about the technology in order to increase the learning in a certain context or in an interdisciplinary context (Friedman, Bolick, Berson and Porfeli, 2009). 'Teacher' and 'technology' constitute the two crucial elements in the teaching-learning process. Because these elements have significant influence on the learning of students. Teachers who take up different roles in today's education are required to know how to use the technology and teach students how to use it with the purpose of learning (Alpar, Batdal, and Avci, 2007).

The efficient use of technology in education is possible not with bringing the best technological tools to the school but with skilled teachers who have a vision and can establish the relationship between student, computer, and learning. For this reason, modern technology should be made the most of. However, it should be kept in mind that in a system in which the subject is a human, the priority should always be quality (Tedmem, 2015). In this context, teachers are required to gain the skills of information and communication technologies, media and digital literacy, etc. in order to acquire these skills to the students (Yaylak, 2018). According to The National Ministry of Education (MNE), necessary studies should be conducted pertinaciously for the subject of integrating technology with education. In order for prospective teachers to reach the desired

achievement in their vocational lives, first, they should accept the role of technology in education and acquire the ability to use it. Because when prospective teachers start their duty, they will encounter with a student group which is intimate with technology (Erdemir, Bakirci, and Eyduran, 2009). It can be observed that in the education society of the 21st century in which the features of learners' increase day by day, the new generation of prospective teachers who would present this service comply with the technology, however, they experience problems about using and adapting it to education (Tatli and Akbulut, 2017). In this context, specialists and authorities of teacher training policies and strategies emphasize that the integration of technology to the learning environments can only be provided with an efficient reform that would be carried out in the pre-service teacher training process (Hur, Cullen and Brush, 2010). In this case, prospective teachers must receive required and sufficient education in the faculties of education on the subjects of software, hardware, use of current technology and the use of technology in education (Tatli and Akbulut, 2017).

Another variable that was examined within the scope of the research is the attitude. Attitude is defined as a stable and judgmental tendency which causes an individual to think, feel, or behave positively or negatively towards a certain person, group, object, and incident (Budak, 2005). As stated by Prensky (2001), today's students comprise a generation which was born within the technology as 'digital native' and use technology better than their teachers. In this case, it is essential for prospective teachers who would educate the students of the 21st century to have positive attitudes towards the use of technology in education (in-school or out-of-school). When prospective teachers start their duty, their attitudes and self-confidence towards the use of technology play an essential role in the achievement of students and whether or not using technology in in-class practices (Christanse, 2002; McGrail, 2005). Researches in this field comprise of subjects such as the use of technology in education by teachers and prospective teachers, integration of technology to the education, techno-pedagogical field knowledge, usage of web 2.0 tools and social networks in education.

When the conducted researches are examined, it can be stated that the use of technology in education is seen more in international literature and the awareness level of using technology in education is higher than Turkey in terms of teachers, academicians, and students. The reason for this is because developed countries are in the production of technology, and naturally, the usage of these technologies are seen more prevalent in education, just as it is seen more in every field. In addition to this, it can be observed that learning environments and teachers adapt to the use of technology in education more quickly and use technology in education more efficiently (Yaylak, 2017). In the literature, it is stated that the integration of technology to education can be carried out through a well-organized plan on the levels of system and school. Accordingly, the planning of human resources is as important as the infrastructure (Cakiroglu, 2013). For this reason, researching the attitudes of prospective teachers on the use of technology in education before they start their duty has importance in the context of this research.

Although teachers receive pre-service and in-service training, they struggle and even fail in integrating technology to education in classroom (Bullock, 2004; Kiridis, Drossos and Tsakiridou, 2006; Lim, 2007; OECD, 2015; Tezci 2009; Valcke et al., 2007; Yalin, Karadeniz and Sahin, 2007; Yildirim, 2007; Goktas, Gedik and Baydas, 2013; Tondeur, Pareja Roblin, van Braak, Voogt and Prestridge, 2017). According to the report that was prepared by OECD (2015), titled 'Students, Computers and Learning: Making the Connection,' investing in information and communication technologies in education does not create a significant improvement in the reading, mathematics and science performances of students. In their research, Demiraslan and Usluel (2005) stated that although most of the teachers can use computers, they do not engage in activities on the integration of ICT to the learning-teaching process and prefer the methods that they are accustomed of. Since teachers are not capable of integrating these technologies into the education process, they feel reluctant to use them (Collis and Moonen, 2008). Using technology in education may positively influence educational outputs. However, it may not be influential on its own in increasing the quality of education (Ertmer, 2005). On the other hand, Chen (2012) stated that teachers should feel confident and competent in integrating technology to education and learning of students in classrooms where the technological possibilities increase. Albion (2000) suggests that in order to successfully integrate technology to the education, prospective teachers should implement the technology with mentor teachers who are 'confident, competent, and consistent.'

When the literature is examined on the use of technology in education, it can be observed that foreign researches are more in number. Although there are various researches in Turkey on the use of technology in education, it was concluded that there are a limited number of researches on the use of technology in education by prospective teachers whose pedagogical formation certificate program continue. This research has importance in this respect and considered to contribute to the literature. Within the scope of the research, it was aimed to determine the attitudes and opinions of prospective teachers who are in Pedagogical Formation Certificate program towards the use of technology in education. By this purpose, the answers to the following questions were sought:

1. What are the attitudes of prospective teachers towards the use of technology in education?
2. Do the attitude scores of prospective teachers towards the use of technology in education differ significantly by the variables of gender, education status, age, faculty, department, and university?
3. What are the prospective teachers' opinions on the use of technology in education?

METHOD

In this section, information about the design, population, sample, data collection tools, and the data analysis of the research was given.

Research Design

This research; It has been designed according to the mixed research model in order to determine and evaluate the attitudes and opinions of prospective teachers who are attending Pedagogical Formation Education Certificate Program. A mixed research model is a research strategy involving multiple research methods. The mixed research model also means working with different data types (Brannen, 2005). Greene, Caracelli, and Graham (1989); defines the mixed research design as research designs that include at least one quantitative and one qualitative method. To research, a mixed way is to present, analyze, and combine events in a framework using various methods. Creswell and Clark (2015), the main purpose of the mixed method and the main principle of the combination of quantitative and qualitative approaches, research problems, and provide a better understanding of a complex phenomenon. In this mixed-method research, where quantitative and qualitative research methods were applied together, 'Exploratory Sequential Pattern' was preferred. According to Creswell (2006); qualitative data are collected after quantitative data is collected and analyzed. The purpose of qualitative data collection; to support the findings obtained from quantitative data. The data are analyzed separately but combined in the interpretation and discussion sections, the relationship between the two data sets is revealed. In this way, the researcher; analyze in-depth the data obtained from the problem situation from a holistic perspective.

The Population and the Sample of the Research

The population of the research consists of 489 prospective teachers who take the 'Use of Technology in Education' course within the framework of Pedagogical Formation Certificate program in a state university in the academic year of 2018-2019, and the sample of the research consists of 216 prospective teachers as 143 females and 73 males. Since the researcher is the lecturer of the course, the research was conducted by the convenience sampling method. Demographic information about the participants of the quantitative research was given in Table 1.

Table 1. Demographic Information on the Sample of the Quantitative Research

		N	%
Gender	Female	143	66.2
	Male	73	33.8
Education status	Graduated	60	27.8
	Not Graduated	156	72.2
Age	1. 20 – 24 Years	143	66.2
	2. 25 – 30 Years	50	23.1
	3. 31 – 35 Years	10	4.6
	4. 36 – 40 Years	6	2.8
	5. 41 and above	7	3.2
	1. The Faculty of Music and Performing Arts	27	12.5
	2. The Faculty of Science and Letters	115	53.2

Graduate Faculty	3.	School/Vocation School	29	13.4
	4.	The Faculty of Economics and Administrative Sciences	16	7.4
	5.	The Faculty of Theology	7	3.2
	6.	The Faculty of Fine Arts	15	6.9
	7.	The Faculty of Health Sciences	7	3.2
Graduated Field	1.	Visual Arts	11	5.1
	2.	Graphic Design	2	0.9
	3.	Physical Education	23	10.6
	4.	Philosophy	12	5.6
	5.	Other	5	2.3
	6.	Physics	4	1.9
	7.	Chemistry	3	1.4
	8.	Biology	10	4.6
	9.	Accounting and Finance	14	6.5
	10.	Health	11	5.1
	11.	Maths	14	6.5
	12.	Imam Preacher	7	3.2
	13.	English Language and Literature	58	26.9
	14.	History	4	1.9
	15.	History of Art	6	2.8
	16.	Music	28	13.0
	17.	Information Technologies	4	1.9
University	1.	Ordu University	145	67.1
	2.	Giresun University	9	4.2
	3.	Karadeniz Technical University	8	3.7
	4.	Ondokuz Mayıs University	7	3.2
	5.	Sinop University	2	0.9
	6.	Atatürk University	8	3.7
	7.	Anadolu University	7	3.2
	8.	Yeditepe University	2	0.9
	9.	Yıldız Technical University	2	0.9
	10.	Çanakkale University	4	1.9
	11.	Cumhuriyet University	2	0.9
	12.	Kocaeli University	2	0.9
	13.	Mehmet Akif Ersoy University	2	0.9
	14.	Namık Kemal University	2	0.9
	15.	Other ²	14	6.5
Total			216	100

When the demographic information that is given in Table 1 is examined, it can be observed that 143 females (66.2%) and 73 males (33.8%) participated in the research. Sixty of these prospective teachers have graduated from university (27.8%), and 156 of them were still students (72.2%). There are 143 prospective teachers in the

²Since the statistical analyzes could not be performed in cases where there is not more than one data set, the universities which are one participant were gathered under the "Other" framework. These; Sitki Koçman, Celal Bayar, Dumlupınar, İstanbul, Balıkesir, Uşak, Ankara, Kafkas, Bartın, Erciyes, Fırat, Hacettepe, Bitlis Eren University. Food and beverage services, Child development, Furniture and interior spaces, Machinery and Geography departments are gathered under the "Other" framework.

age group of 20-24 (66.2%), 50 prospective teachers in the age group of 25-30 (23.1%), 10 prospective teachers in the age group of 31-35 (4.6%), 6 prospective teachers in the age group of 36-40 (2.8%) and 7 prospective teachers in the age group of 41 and above (3.2%). It can be observed that there are 27 participants from The Faculty of Music and Performing Arts (12.5%), 115 participants from The Faculty of Science and Letters (53.2%), 29 participants from School/Vocational School (13.4%), 16 participants from The Faculty of Economics and Administrative Sciences (7.4%), 7 participants from The Faculty of Theology (3.2%), 15 participants from The Faculty of Fine Arts (6.9%) and 7 participants from The Faculty of Health Sciences (3.2%). When generally evaluated, it can be observed that the number of participant prospective teachers who are females, in their senior year, in the age group of 20-24, studying in the Faculty of Science and Letters, in the departments of English Language and Literature, Music and Physical and studying in Ordu University are predominant. The demographic information of the prospective teachers who participated in the qualitative part of the study is given in Table 2.

Table 2. Demographic Information on the Sample of the Qualitative Research

Prospective Teachers	Gender	Field	Faculty	University
PT1	Female	English Language and Literature	The Faculty of Science and Letters	Ordu University
PT2	Female	Health	The Faculty of Health Sciences	Bitlis Eren University
PT3	Female	Music	The Faculty of Music and Performing Arts	Ordu University
PT4	Male	Maths	The Faculty of Science and Letters	Karadeniz Technical University
PT5	Male	Sculpture	The Faculty of Fine Arts	Ordu University
PT6	Male	Geography	The Faculty of Science and Letters	Ondokuz Mayıs University
PT7	Female	Music	The Faculty of Music and Performing Arts	Ordu University
PT8	Female	Music	The Faculty of Music and Performing Arts	Ordu University
PT9	Female	Painting	The Faculty of Fine Arts	Kastamonu University
PT10	Female	Music	The Faculty of Music and Performing Arts	Ordu University
PT11	Female	Music	The Faculty of Fine Arts	Erciyes University
PT12	Male	Music	The Faculty of Music and Performing Arts	Ordu University
PT13	Male	Music	The Faculty of Music and Performing Arts	Ordu University
PT14	Male	Music	The Faculty of Music and Performing Arts	Ordu University
PT15	Female	Music	The Faculty of Music and Performing Arts	Ordu University
PT16	Female	Child Development	The Faculty of Health Sciences	Avrasya University

When Table 2 is examined; A total of 16 prospective teachers participated in the qualitative part of the research, 10 of which were female (62%) and 6 were male (38%). It was observed that there was a concentration in the field of music (n = 9; 58%). On the other hand, English Language and Literature (n = 1; 6%), Health (n = 1; 6%), Sculpture (n = 1; 6%), Maths (n = 1; 6%), Geography (n = 1; 6%), Painting (n = 1; 6%), and In the field of Child Development (n = 1; 6%), it was observed that prospective teacher participated. Faculty of Music and Performing Arts (n = 8; 50%), Faculty of Fine Arts (n = 3; 19%), Faculty of Sciences and Letters (n = 3; 19%) and Faculty of Health Sciences (n = 2; 12%) prospective teachers participated in the research. Prospective teachers who participated in qualitative research; Ordu University (n = 10; 64%), Bitlis Eren University (n = 1; 6%), Kastamonu University (n = 1; 6%), Ondokuz Mayıs University (n = 1; 6%), Karadeniz Technical University (n = 1; 6%), Erciyes University (n = 1; 6%) and Eurasia University (n = 1; 6%).

Data Collection Tools of the Research

In the quantitative research, the data from the participants was collected with '*Personal Information Form*' and '*Attitude Towards the Use of Technology*' which was developed by Yavuz (2005) and consisted of 19 items. The data was collected with a scale which consists of 19 items and prepared in five-dimensional five-point Likert type that aims to determine the attitudes of prospective teachers towards the teaching profession. 6 of these 19 items (items of 1, 2, 3, 4, 5 and 13) include negative statements. The reverse scores of negative statements were evaluated as (1=5, 2=4, 3=3, 4=2, 5=1). The assessment tool was evaluated as 1= Totally Disagree, 2=Disagree, 3=Neutral, 4=Agree, and 5= Totally Agree. The Cronbach Alpha internal consistency coefficient, which was calculated by Yavuz (2005) was found .93. In this research, KMO value was calculated as .84, Bartlett test value was calculated as 1496, internal consistency coefficient (Cronbach Alpha) was calculated as .81. 71, which is the highest obtainable score from the scale, indicates the positive attitudes and 43, which is the lowest score, indicates the negative attitudes. The highest obtainable score with the 'neutral' option is 57. This indicates the neutral statuses. In this context, scores that are above 58 points indicate positive attitudes and scores that are below 56 indicate negative attitudes. In the qualitative part of the research; 16 prospective volunteer teachers were interviewed among the prospective teachers who participated in the quantitative research. Prospective teachers' opinions were collected online through a semi-structured interview form. Different methods were used in the qualitative research part to ensure the validity and reliability of the codes. In order to ensure the reliability of the content analysis, the reliability of the researcher was used. The data obtained were shared with an expert to make an independent coding, and then the coding of the researcher and the expert was compared. Miles and Huberman (2016) suggested that comparisons with values above 70% were accepted as reliable (Reliability = Reconciliation Number / Reconciliation + Non-Reconciliation Number) and the reliability value was found to be approximately 92%. In qualitative research, validity can be provided by studies such as making data diversification, explaining the characteristics of the research group in detail, reporting data in detail, and extracting data (Creswell, 2015). For this reason, which prospective teachers statements are based on, the code network and code matrix, and the frequency and percentages expressed by

prospective teachers are presented in tables and figures. Also, the validity and reliability of the research were increased by expressing the codes given in the presentation of the findings clearly and supporting them with direct quotations.

Data Analysis

In the quantitative part of the research, single-sampled Kolmogorov Smirnov test was conducted in order to determine whether or not the dependent variables show normal distribution. According to the obtained results, it was determined that dependent variables do not show normal distribution [*Attitude Towards the Use of Technology*'scale K-S (z) = 4.148; p: 0.00]. Kurtosis and skewness values were also examined in order to determine whether or not the data show normal distribution. In the conducted analyses, it was determined that the data do not show normal distribution (Skewness: -.673; Kurtosis: 4.773). In the analyses of the data, descriptive statistics (i.e., frequency, percentage, average), reliability analysis, Mann Whitney U, Kruskal Wallis, and Games-Howel tests as Post-Hoc test were used. SPSS 25.00 program was used in order to conduct these analyses. In the qualitative part of the research; the data obtained were analyzed by content analysis in MaxQDA qualitative analysis program. Content analysis was conducted according to the questions asked to prospective teachers. The codes were determined and interpreted according to the answers obtained. In the content analysis of the obtained data, abbreviations such as prospective teacher 1 (PT1, PT2, PT3, etc.) were used for each prospective teacher.

FINDINGS

This research conducted with prospective teachers consists of two parts: quantitative and qualitative. In the process, firstly quantitative research and then qualitative research findings are given.

Part 1. Quantitative Research

The obtained findings were examined as tables within the context of the quantitative research questions. The Arithmetic mean and standard deviation values of the attitude scores of prospective teachers towards the use of technology in education were given in Table 3.

Table 3. The Arithmetic Mean and Standard Deviation Values of the Attitude Scores of Prospective Teachers Towards the Use of Technology in Education

Sub Dimensions	N	\bar{x}	Ss
1. Non-Use of Technological Tools in Education	216	1.64	.620
2. Using Technological Tools in Education	216	4.15	.691
3. The Effects of Technology on Education	216	4.06	.536
4. Teaching the Use of Technological Tools	216	4.12	.666
5. Evaluation of Technological Tools	216	3.89	.752

When Table 3 is examined, it can be observed that the mean score of 'Not using the technological tools in education' sub-dimension was (\bar{x} =1.64), mean score of 'Using the technological tools in education' sub-dimension was (\bar{x} =4.15), mean score of 'The effects of technology in educational life' sub-dimension was (\bar{x} =4.06), mean score of 'Teaching the usage of technological tools' sub-dimension was (\bar{x} =4.06) and 'The evaluation of technological tools' sub-dimension was (\bar{x} =3.89). According to the mean scores of scale's sub-dimensions, it can be observed that the prospective teachers stated positive opinions towards the use of technology in education. Mann Whitney U test results of attitude scores of prospective teachers towards the use of technology in education by the gender variable were given in Table 4.

Table 4. Mann Whitney U Test Results of Attitude Scores of Prospective Teachers Towards the Use of Technology in Education by the Gender Variable

Gender	N	Mean Rank	Sum of Ranks	Mann W. U.	p
Female	143	113.85	16281.00	4454.000	.078
Male	73	98.01	7155.00		

When Table 4 is examined, it was observed that there was not a significant difference between the attitudes of participants which consist of 143 female and 73 prospective male teachers towards the use of technology in education according to their gender [$p > .05$]. Although prospective female teachers are more in number both in terms of numerically and in terms of mean scores, a significant difference was not observed. This situation may derive from the fact that male students are interested more in technology than female students. Mann Whitney U test results of attitude scores of prospective teachers towards the use of technology in education by the education status variable were given in Table 5.

Table 5. Mann Whitney U Test Results of Attitude Scores of Prospective Teachers Towards the Use of Technology in Education by the Education Status Variable

Education Status	N	Mean Rank	Sum of Ranks	Mann W. U.	p
Graduated	60	131.08	7864.50	3325.500	.001*
Not Graduated	156	99.82	15571.50		

When Table 5 is examined, it was observed that there was a significant difference between the attitudes of prospective teachers towards the use of technology in education according to their graduation status [$p < .05$]. It is observed that this difference is in favor of prospective teachers who have graduated from university. Kruskal Wallis H test and Post Hoc test results of attitude scores of prospective teachers towards the use of technology in education by the age variable were given in Table 6.

Table 6. Kruskal Wallis H Test and Post Hoc Test Results of Attitude Scores of Prospective Teachers Towards the Use of Technology in Education by the Age Variable

Age	N	Mean Rank	sd	X2	p	Differentiation (Games- Howell)
20 – 24 Years	143	100.98				
25 – 30 Years	50	111.00				
31 – 35 Years	10	130.45	4	14.876	.005	1 to 4*
36 – 40 Years	6	183.00				
41 and above	7	149.00				

*In favor of.

In Table 6, it was observed that there was a significant difference between the attitudes of prospective teachers towards the use of technology in education according to their age [$p < .05$]. When the Post Hoc test results are examined, it was concluded that between the age groups of 20 - 24 and 36 - 40, the significant difference is in favor of the second group [$p < .05$]. The age group of 20 - 24 can be identified as Generation Z. However, although the age group of 36 - 40 is Generation Y, the finding of higher attitude scores of this generation towards the use of technology in education can be interpreted as the contradiction to the Generation Z being a digital native. Kruskal Wallis H test and Post Hoc test results of attitude scores of prospective teachers towards the use of technology in education by the faculty variable were given in Table 7.

Table 7. Kruskal Wallis H test and Post Hoc Test Results of Attitude Scores of Prospective Teachers Towards the Use of Technology in Education by the Faculty Variable

Faculty	N	Mean Rank	sd	X2	p	Differentiation (Games- Howell)
The Faculty of Music and Performing Arts	27	97.78				
The Faculty of Science and Letters	115	108.43				
School/Vocation School	29	76.66				
The Faculty of Economics and Administrative Sciences	16	143.66	6	17.446	.008	3 to 4* and
The Faculty of Theology	7	134.29				3 to 6*
The Faculty of Fine Arts	15	134.00				
The Faculty of Health Sciences	7	122.21				

*In favor of.

When Table 7 is examined, it was observed that there was a significant difference between the attitudes of prospective teachers towards the use of technology in education according to the faculty they study [$p < .05$]. As a result of the Post Hoc tests, this significant difference was in favor of The Faculty of Economics and Administrative Sciences compared to College/Vocational School and in favor of The Faculty of Fine Arts compared to College/Vocational School. Most of the prospective teachers studying at College/Vocational

School are studying in The Department of Physical Education. Since the use of technology is seen less in Physical Education lesson than other lessons, this situation may have influenced this result. Kruskal Wallis H test and Post Hoc test results of attitude scores of prospective teachers towards the use of technology in education by the department they study variable were given in Table 8.

Table 8. Kruskal Wallis H Test and Post Hoc Test Results of Attitude Scores of Prospective Teachers Towards the Use of Technology in Education by the Department They Study Variable

Department	N	Mean Rank	sd	X2	p	Differentiation (Games- Howell)
Visual Arts	11	151.32				
Graphic Design	2	128.75				
Physical Education	23	67.00				
Philosophy	12	87.33				
Other	5	67.30				
Physics	4	196.00				
Chemistry	3	102.67				1* to 3, 2* to 3,
Biyology	10	120.70				6* to 3, 9* to 3,
Accounting and Finance	14	142.14	16	40.776	.001	6* to 4, 6* to 11,
Health	11	127.77				6* to 13, 6* to 15,
Maths	14	102.68				6* to 16
Imam Preacher	7	134.29				
English Language and Literature	58	111.29				
History	4	52.75				
History of Art	6	87.92				
Müsic	28	96.80				
Information Technologies	4	153.13				

When Table 8 is examined, it was observed that there was a significant difference between the attitudes of prospective teachers towards the use of technology in education according to the department they study [$p < .05$]. As a result of the Post Hoc tests, this significant difference was in favor of the former departments that are stated below; between Visual Arts and Physical Education, between Graphic Design and Physical Education, between Physics and Physical Education, between Accounting and Financing and Physical Education, between Physics and Philosophy, between Physics and Mathematics, between Physics and English Language and Literature, between Physics and Art History and between Physics and Music. Kruskal Wallis H test and Post Hoc test results of attitude scores of prospective teachers towards the use of technology in education by the university variable were given in Table 9.

Table 9. Kruskal Wallis H Test and Post Hoc Test Results of Attitude Scores of Prospective Teachers Towards the Use of Technology in Education by the University Variable

University	N	Mean Rank	sd	X2	p	Differentiation (Games- Howell)
Ordu University	145	97.01				
Giresun University	9	130.83				
Karadeniz Technical University	8	125.38				
Ondokuz Mayıs University	7	157.29				
Sinop University	2	106.00				
Atatürk University	8	147.50				
Anadolu University	7	139.93				1* to 14, 6* to 14,
Yeditepe University	2	207.75	14	30.325	.007	7* to 14,
Yıldız Technical University	2	205.50				9* to 1, 9* to 15,
Çanakkale University	4	101.25				15* to 14
Cumhuriyet University	2	166.50				
Kocaeli University	2	122.25				
Mehmet Akif Ersoy University	2	154.25				
Namık Kemal University	2	51.50				
Other	14	106.86				

In Table 9, it was observed that there was a significant difference between the attitudes of prospective teachers towards the use of technology in education according to their university [$p < .05$]. As a result of the Post Hoc tests, this significant difference was in favor of the former universities that are stated below; between Ordu University and Namık Kemal University, between Atatürk University and Namık Kemal University, between Anadolu University and Namık Kemal University, between Yıldız Technical University and Ordu University, between Yıldız Technical University and Other, between Other and Namık Kemal University. This difference may derive from the differences of the university, faculty, and department that students study, teaching methods of instructors and the technological infrastructure of the universities.

Part 2. Qualitative Research

In the qualitative step of the study, the opinions of the prospective teachers were taken with a semi-structured interview form. Prospective teachers were asked four questions via interview form. These;

1. Do you think that technology should be used in educational processes? Why is that?
2. Are there any benefits for you in using technology in educational processes? Please explain.
3. Are there any harm to you in using technology in the education process? Please explain.
4. What do you think about the relationship between education and technology in the future?

In the qualitative part of the research, 'Do you think that technology should be used in educational processes?' MAX Maps Code Coexistence Model Regarding the Question was given in Figure 1.

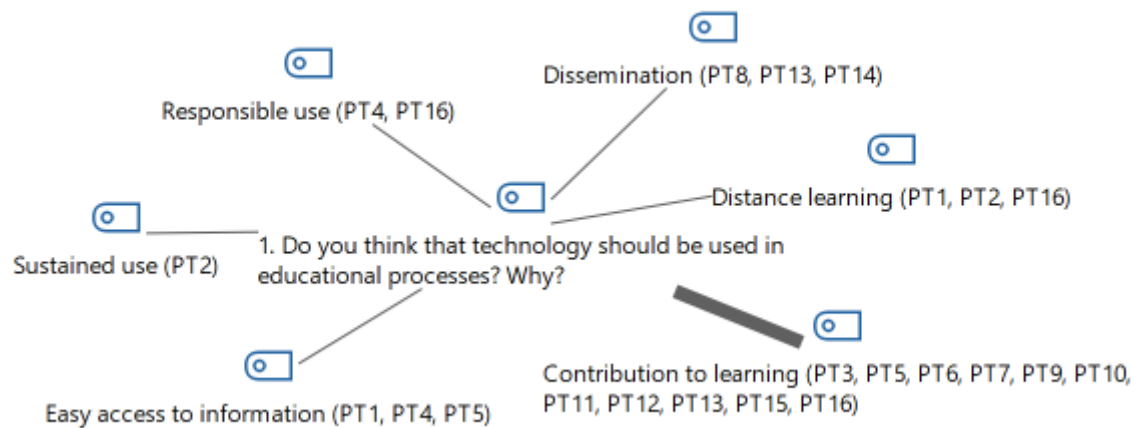


Figure 1. 'Do you think that technology should be used in educational processes?' MAX Maps Code Coexistence Model Regarding the Question

When Figure 1 is examined; It was determined that Contribution to learning ($f=11$; 68.75%), Distance learning ($f=3$; 18.75%), Easy access to information ($f=3$; 18.75%), Dissemination ($f=3$; 18.75%), Responsible use ($f=2$; 15.50%), and Sustained use ($f=1$; 6.25%) there were six (6) codes from the opinions of the prospective teachers to the 'Do you think that technology should be used in educational processes?' question. It is seen that the most frequently repeated 'Contribution to learning' code. All of the prospective teachers (100%) stated that technology should be used in their educational processes. Also, the use of technology in educational processes at the right time; they will contribute to the learning of students, teachers and students will have access to information quickly and easily, students will continue to learn outside the school, and the use of technology in education stated that widespread. The opinions of prospective teachers; 'I think it provides the depth of understanding in education.' (PT3), 'Technology allows us to learn more fun and more remarkable lessons.' (PT7), 'Also, because we live in the age of technology, they attract students' attention and realize better learning.' (PT12), 'When used correctly, I think that students significantly support the learning process. Smartboards are the first example of the use of technology in education. Smartboard applications allow the student to access the lessons applied from anywhere in the classroom. I think that using technology, especially in education, will be very beneficial for visual education because, with smartboard application, visual education information will be more permanent. It will draw attention to the information taught by taking power from the visibility of the smart board rather than a teacher who teaches at the desk and will make it more memorable.' (PT16), 'Yes, because we can access every information, and it gives us speed and time.' (PT4), 'At the same time, students can participate in live lectures.' (PT1), and 'Because technology is taking place in every moment of life due to the era we are in. Therefore, it should be used in the training process.' (PT14) examples of these. 'Are there any benefits for you in using technology in educational processes?' MAX Maps Code Coexistence Model regarding the question was given in Figure 2.

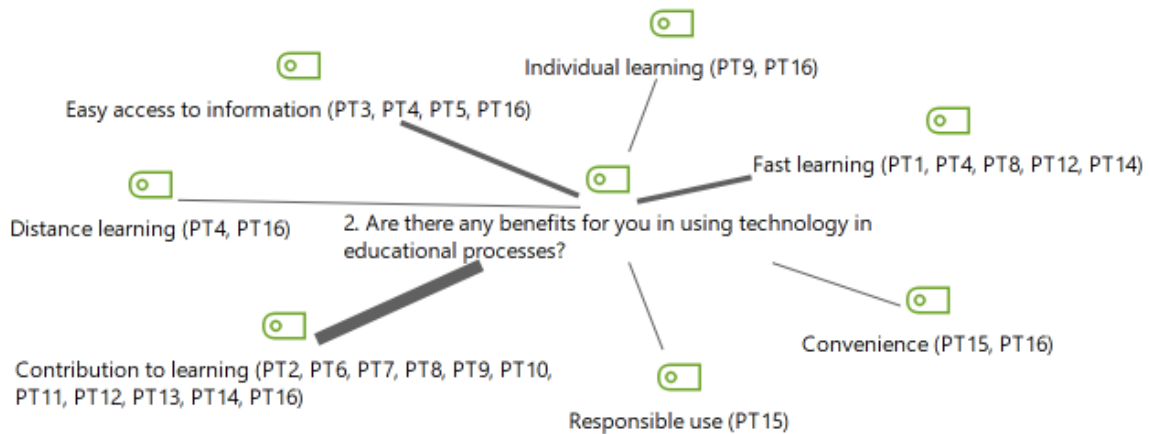


Figure2. 'Are there any benefits for you in using technology in educational processes?' MAX Maps Code Coexistence Model Regarding the Question

When Figure 2 is examined; It was determined that seven (7) codes Contribution to learning (f=11; 68.75%), Fast learning (f=5; 31.25%), Easy access to information (f=4; 25.00%), Distance learning (f=2; 12.50%), Individual learning (f=2; 12.50%), Convenience (f=2; 12.50%), and Sustained use (f=1; 6.25%) were found from the opinions of the prospective teachers to the 'Are there any benefits for you in using technology in educational processes?' question'

The most frequently repeated codes are 'Contribution to learning,' 'Fast learning,' and 'Easy access to information.' All of the prospective teachers (100%) stated that it is beneficial to use technology in their educational processes. Prospective teachers in terms of the benefits of using technology in educational processes; stated that when used responsibly and correctly, it will contribute to learning, learning will take place quickly and remotely and this will increase individual learning opportunities. The opinions of prospective teachers; 'In my opinion, meaningful learning is provided with visuals, videos, and graphics instead of plain expression, which makes it permanent and provides education benefit.' (PT6), 'The benefits in supplementary teaching are quite high and performing the individualized teaching process with technology removes the obstacle on education.' (PT9), 'When used correctly, it facilitates and accelerates education and training. Doğru kullanıldığı zaman eğitim ve öğretimi hem kolaylaştırır hem hızlandırır. Because we live in the age of technology, students are educated with technology that they know best.' (PT12), 'Develop research skills. It enables them to learn with fun and therefore creates the desire for learning in the student. It also benefits for personal learning and repetition.' (PT16), 'I think it is perfect for distance education. So we can say that there is an education where technology exists.' (PT4), 'Because it can make information and learning easier and fun for even some age groups in a short time. In this respect, I think that technology is beneficial in education.' (PT14), and 'Because it is possible to reach the desired information easily with a single word. Searching from books may be more precise, but thanks to technology, they can easily access any information at any time.' (PT16) examples of these. 'Are

there any harm to you in using technology in the education process?'MAX Maps Code Coexistence Model regarding the question was given in Figure 3.

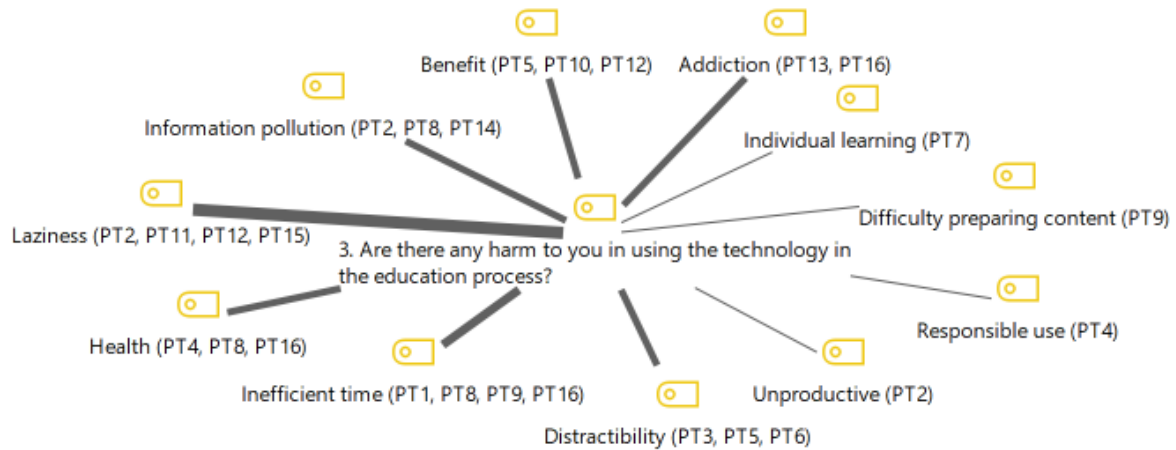


Figure3. 'Are there any harm to you in using technology in the education process?'MAX Maps Code Coexistence Model Regarding the Question

When Figure 2 is examined; It was determined that eleven (11) codes Contribution to learning Laziness (f=4; 25.00%), Inefficient time (f=4; 25.00%), Distractibility (f=3; 18.75%), Information pollution (f=3; 18.75%), Benefit (f=3; 18.75%), Health (f=3; 18.75%), Addiction (f=2; 12.50%), Individual learning (f=1; 6.25%), Unproductive (f=1; 6.25%), Responsible use (f=1; 6.25%), and Difficulty preparing content (f=1; 6.25%) were found from the opinions of the prospective teachers to the 'Are there any harm to you in using the technology in the education process?' question.

Among these codes, the most frequently repeated 'Laziness,' 'Inefficient time,' 'Distractibility,' 'Information pollution,' and 'Health' codes are seen. All of the prospective teachers (100%) stated that besides the benefits of using technology in their educational processes, they also have losses. Prospective teachers stated that the use of technology in educational processes could push students to laziness, make them dependent, cause distractions, and inefficient their time. In addition to the benefits of using technology in education processes, they stated that students should be used responsibly and carefully because there is information pollution on the internet. The opinions of prospective teachers; 'Quickly and easily to access internet environments filled with information pollution will not only drive the individual to laziness but will also greatly reduce productivity.' (PT2), 'Although it does not do much harm, I think it might get used to putting it up a bit. It should not be brought into addiction dimension; it may cause asociality in students.' (PT11), 'Students can spend a long time playing games at the computer. Such activities cause them to use their time inefficiently.' (PT1), 'While there are benefits of using technology, there are also damages. When students use the technology out of purpose, there is a waste of time, and the student is not interested in the course and will fail.' (PT16), 'Quickly and easily to access, information-filled internet environments will not only drive the individual to laziness but

will also greatly reduce productivity.’(PT2), ‘The only harm can be radiation from technological tools.’(PT4), ‘If the concept of metacognition has not developed in a student, it may shift his attention to different places and move away from the course.’(PT3), ‘It causes attention to shift from academic knowledge to very different things. For this, it is appropriate to use technology according to the developmental periods of the student.’(PT6) examples of these. ‘What do you think about the relationship between education and technology in the future?’ MAX Maps Code Coexistence Model regarding the question was given in figure 4.

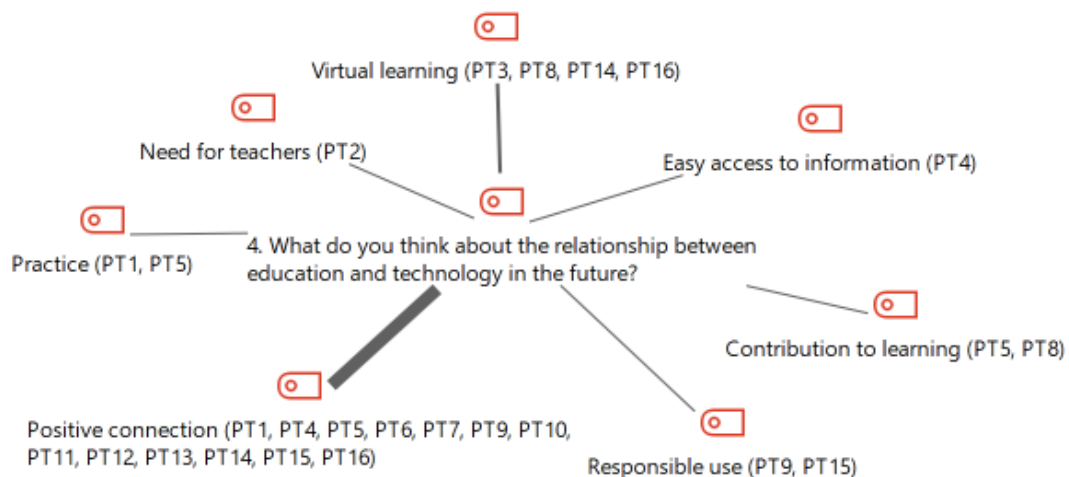


Figure 4. ‘What do you think about the relationship between education and technology in the future?’ MAX Maps Code Coexistence Model Regarding the Question

When Figure 2 is examined; It was determined that seven (7) codes Positive connection (f=13; 81.25%), Virtual learning (f=4; 25.00%), Responsible use (f=2; 12.50%), Practice (f=2; 12.50%), Contribution to learning (f=2; 12.50%), Easy access to information (f=1; 6.25%), and Need for teachers (f=1; 6.25%) were found from the opinions of the prospective teachers to the ‘What do you think about the relationship between education and technology in the future?’ question. Among these codes, it is seen that the most frequently repeated ‘Positive connection’ code. The prospective teachers stated that the concepts of technology and education will continue to increase their connections with each other in the future, that students will continue to learn virtually but that the need for teachers will always be. Prospective teachers' statements about this situation; ‘I think that if the connection between education and technology is strong and used correctly, it can lead to a successful learning process.’(PT1), ‘Education and technology will contribute to the upbringing of young generations as an inseparable whole in the coming years.’(PT5), ‘I think that education and technology are inseparable in this period.’(PT12), ‘I think education and technology are two closely related concepts. I think that the changes will increase and increase according to each year. I think that in the future there will be no need to use the pencil eraser, etc. in the classroom, but only the textbooks will not be used.’(PT16), ‘With the rapid advancement of technology, I think that education will continue only in virtual environments or I think that artificial intelligence

teachers will come out.'(PT3), *'Perhaps it can be thought that direct education can be provided without the need for a teacher.'*(PT8), *'The need for teachers will decrease with the increase in technology in education. However, since empathy cannot be established with technological tools, the teacher's position will never be settled.'*(PT2), *'With the opportunities provided by technology, more permanent and comprehensive learning environments will be formed.'*(PT5) can be given as examples.

DISCUSSION, CONCLUSION, AND SUGGESTIONS

In this research, it was aimed to examine the attitudes of prospective teachers who continue the pedagogical formation certificate program towards the use of technology in education and it was concluded that the attitude scores of prospective teachers towards the use of technology were high. In their research, Usta and Korkmaz (2010) stated that the attitudes of prospective teachers towards the use of technology in education were positive and as their level of technological literacy increases, their positive attitude towards the use of technology increases as well. Researches in the literature (Hammond and Manfra, 2009; Russell, Bebell, O'Dwyer and O'Connor, 2003) demonstrate similar results with the results of this research. In contrast to these results, in their research, Christensen and Knezek (2000) stated that the attitudes of prospective teachers towards the use of technology in education were low.

There were no significant differences between the genders of prospective teachers and their attitude towards the use of technology in education. It was concluded that both the male and prospective female teachers have positive attitudes towards the use of technology in education. In their research, Seferoğlu and Akbıyık (2005) stated that there was not a significant difference between self-efficacy perceptions of primary school teachers towards the computer and the gender variable. The results of the conducted researches (Bakioglu, Kuçukaydin and Karamustafaoglu, 2015; Cakmak and Taskiran, 2014; Mumcu and Usta, 2015; Timur, Yilmaz, and Timur, 2013; Simsek and Yildirim, 2016) which indicate that the attitude towards the use of technology does not differ according to the gender variable show similarities with the results of this research. On the other hand, Berkant (2013) stated that the attitude and self-efficacy perceptions of prospective male teachers towards the computer and computer-aided education were higher than prospective female teachers.

There were significant differences between the attitudes of prospective teachers towards the use of technology in education and the variable of having graduated from university. It was concluded that the prospective teachers who have graduated from the university have higher attitude scores towards the use of technology in education. In the study of Kolomuc (2019), which was conducted with primary school teachers, it was stated that the 4th-grade students consider themselves more competent in using technology in education than the students in lower grades. The results of the studies of Sezgin, Erdogan, and Erdogan (2017) and Cetin and Gungor (2014) show similarities with the results of this research. This situation can be generalized as the increase of attitude and competency on the use of technology in education as the grades of students advance and thus, the education (content) they receive. Most of the prospective teachers who participated in this

research stated that it is necessary to acquire the competency of using technological materials on the subject area in order to graduate from the university. Prospective teachers graduate from university without sufficient knowledge on the use of technology in educational processes and for this reason, when they start to perform their vocation, they experience difficulty in using technology in education and thus, creating digital material (content) (Akkoyunlu, 2002, Bilgin, Tatar and Ay, 2012; Chai, Koh and Tsai, 2010; Celik and Kahyaoglu, 2007; Cil and Cakmak, 2014; Karadeniz and Vatanartriran, 2015; Kolomuc, 2019; Ozgun-Koca, Meagher and Edwards, 2010; Tatli and Akbulut, 2017; Kabakci Yurdakul, 2011).

There were significant differences between the attitudes of prospective teachers towards the use of technology in education and their age. It can be observed that as the age groups of prospective teachers decrease, their attitude towards the use of technology in education becomes more positive. It is known that prospective teachers or teachers whose duty started recently are more disposed to use educational technologies in the classroom and have higher self-confidence than former teachers (Efe, 2011). However, contrary to the expectations, in this research, it was observed that the attitude scores of prospective teachers in the age group of 36-40 towards the use of technology in education were higher than the prospective teachers who were younger than them.

It was concluded that there were significant differences between the attitude of prospective teachers towards the use of technology in education and the faculty they study. It was concluded that there were significant differences between the attitude of prospective teachers towards the use of technology in education and the department they study. Prospective teachers may study in different faculties and departments. However, there are various digital skills that every individual should have in the 21st century. The fact that Physical Education, Imam-Hatip, etc. departments are not intimate with technology does not avert the fact that the prospective teacher requires basic computer skills. In contraction to the results of this research, Karabulut and Ulucan (2012) stated that the self-efficacy levels of prospective physical education teachers on the education technology standards were high. Coklar (2008) stated that the educational technology standards of prospective teachers studying in the faculty of education differ according to the departments they study.

It was concluded that there were significant differences between the attitude of prospective teachers towards the use of technology in education and the university they study. It can be stated that this difference may derive from the fact that the technological infrastructure of the university in which the prospective teacher's study and the status of using technology by the instructors may differentiate.

In the qualitative part of the research, semi-structured interview form was applied to prospective teachers. With this interview form, the opinions of prospective teachers about the use of technology in educational processes were reached. Should technology be used in educational processes? were asked to explain the reasons. According to the data obtained from this question, prospective teachers; technology will become more widespread, and access to information will be easier. They stated that when technology is used

correctly and carefully, it will contribute to the students' learning and also support the students' learning outside the school. Researches (Bakirci, Cancan, and Uzunyol, 2017; Darren, 2004; Cam, 2018; Kacan and Kimzan, 2017; Putman, 2014; Ustun and Akman, 2015; Yamauchi, 2008; Weber, 2014; Yilmaz, Ulucan, and Pehlivan, 2010; Yordming, 2017) have shown that prospective teachers have positive attitudes and opinions about the use of technology in educational processes. Contrary to these studies, Can and Kaymakci (2016) stated that; classroom teachers have negative opinions about the use of technological tools in the education process.

Prospective teachers in terms of the benefits of using technology in educational processes; They stated that their contribution to learning is important, students have access to information faster and thus they learn faster and consequently individual learning increases. In the researches conducted with prospective teachers (Can, 2010; Cevik and Alkan, 2012; Dargut and Celik, 2014; İnel, Evrekli and Balim, 2011; Kabadayı, 2006; Katić, 2008; Koc and Bakir, 2010; Oksuz, Ak and Uca, 2009; Ozen, 2013; Yavuz and Coskun, 2008; Yilmaz, Ulucan and Pehlivan, 2010) have positive opinions about the use of technology in educational processes. In addition to the benefits of using technology in education processes, prospective teachers think that there are damages; stated that there is a high level of information deficiency on the internet and that the excessive use of technology will cause laziness and inefficiency and therefore should be used responsibly. Also, the excessive use of technology in students will reveal various health problems. Although the prospective teachers stated that the use of technology in educational processes has the disadvantages, they emphasized that the benefits are more. The results obtained are similar to those of Gulcu (2014).

Finally, prospective teachers were asked about the future of the link between education and technology. According to the analyzed data, prospective teachers stated that the link between technology and education concepts would continue to increase in the coming years. However, they stated that formal learning will be replaced by virtual learning environments and individual learning and that the need for teachers will decrease. Several prospective teachers emphasized that even though virtual learning environments increased, the need for teachers would always be present. It has been concluded that when technology is used correctly and responsibly in education processes, it will contribute to learning.

According to the results that were obtained from the research, it can be suggested that the technological infrastructure should be developed by carrying out projects in the universities by The Council of Higher Education such as the Movement of Enhancing Opportunities and Improving Technology (FATİH) Project which was carried out by The Ministry of National Education, prospective teachers should acquire technological skills that they need after they start their duty in their universities, not in theory but practice, as the teachers of the 21st century, teachers should have technological literacy which would meet the technological needs of students who are in 'digital native' generation, and new quantitative researches should be conducted on this subject with different sample groups and new qualitative and mixed researches with various study groups.

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