

Preservice Preschool Teachers' Digital Citizenship and The 21st Century Examination Of Century Skills Self-Efficacy Perceptions*

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Abstract: The main purpose of this study is to examine the relationship between digital citizenship and 21st Century Skills self-efficacy perceptions of pre-service preschool teachers. In the study, digital citizenship and 21st century skills were compared in terms of self-efficacy perceptions. 413 pre-service preschool teachers studying at Konya Necmettin Erbakan University and Aydın Adnan Menderes University in the 2021-2022 academic year participated in the study. In order to collect the research data, "Demographic Information Form", "Digital Citizenship Scale" developed by Kuş, Güneş, Başarmak, and Yakar in 2017, and "21st Century Skills Self-Efficacy Perception Scale" developed by Anagün, Atalay, Kılıç, Yaşar in 2016 were applied to the pre-service teachers. According to the results of the study, a significant relationship was found between the digital citizenship perception and 21st century skills self-efficacy perception total scores of the preservice preschool teachers participating in the study. As a result of the research, the total scores of the digital citizenship scale, the variance of the variance on the total scores of the 21st century skills self-efficacy perception scale 22% of the total score variance ($R^2=.22$). In addition, it was concluded that the sub-dimensions of the digital citizenship scale explained 24% of the total score variance of the 21st century skills self-efficacy perception scale ($R^2=.24$).

Keywords: Digital Citizenship, 21st Century Skills, Preschool

1. Introduction

Current developments in information technologies have greatly affected and changed people's lifestyles. Technological developments have had an impact on many areas such as industry, education, communication, and health. In this context, new terms and definitions have emerged in the literature (Yılmaz & Doğusoy, 2020). The information community created by information technologies interacts with each other regardless of time and space (Odabaşı, Mısırlı, Erol, Timar, Ersoy, Som, Dönmez, İnan, Akçay, & Günüş, 2012).

21st century technological developments shape the world on the basis of change, and the process of learning knowledge and knowledge learning environments are also affected by this change process. With technology, access to information sources is becoming easier and the profile of students, teachers, schools and the traditional education system is also changing (Öğretir Özçelik & Eke, 2020).

Recently, many people, from children to adults, have been using technology and doing their work through the internet (Tan & Merey, 2021). Parlak (2017) stated that digitalization with technology is a revolution that affects all areas of life. For this reason, he characterized the 21st century as the "digital age" (Parlak, 2017). With the widespread use of digital products, the concept of "digital citizenship" has emerged (Tan & Merey, 2021). A digital citizen is a person who is aware of his/her actions while searching for information, trying to communicate with people, sharing harmless and legally non-criminal posts in the virtual environment while using technology effectively, and setting an example with his/her behaviors (Çubukçu & Bayzan, 2013).

Another definition of Digital Citizenship can be defined as norms of behavior regarding the use of technology. Ribble and Bailey (2004), as a way to understand the complexity of digital citizenship and the issues of technology use, misuse and abuse, identified nine general behavioral domains that constitute digital citizenship;

1. Etiquette: electronic standards of behavior or procedure
2. Communication: electronic exchange of information

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3. Education: the process of teaching and learning about technology and its use
4. Access: full electronic participation in the community
5. Trade Buying and selling electronic goods
6. Liability: electronic liability for acts and actions
7. Rights: freedoms for all in a digital world
8. Security: physical well-being in a world of digital technology

9. Security (Individual security): Taking measures to ensure individual safety in the electronic environment (Ribble and Bailey, 2004).

21st century technological, economic, social and political developments have led to changes in the qualifications expected from people. In addition, changes are expected in individuals' competencies, knowledge and skills, and accordingly, education systems are also affected (Cansoy, 2018). Individuals are expected to adapt to the positive variables they encounter, to react correctly to negative variables, and to be able to maintain their professional, social and private lives in a qualified manner. As a result of these, people

They are expected to react meaningfully to the changes that take place, to be able to access the speed of technology, to be able to make accurate analysis and evaluation by selecting the right information from the information community they rapidly access, to be able to transform this information into products by using it correctly in their daily lives, and to have high-level skills and competencies along with these basic skills. These competencies expected from individuals in the information age are defined as 21st century skills (Öğretir Özçelik & Eke, 2020).

The 21st Century Learning Framework was developed with feedback from educators and business leaders to teach the knowledge and skills, specializations and support systems necessary for students to succeed in work, life and citizenship (Partnership for 21st Century Learning, 2007).

21. According to the Partnership for 21st Century Learning (P21), 21st century skills are addressed in 3 themes: learning skills, life skills and information, media and technology skills.

1. Learning and innovation skills: creativity and innovation, critical thinking and problem solving, communication and collaboration.
2. Life and career skills: flexibility and adaptability, initiative and self-management, social and intercultural skills, leadership and responsibility.
3. Information, media and technology skills: information literacy, media literacy, ICT literacy (Partnership for 21st Century Learning, 2019).

In educational standards and assessment, a new concept is a key strategy to complete the necessary transformations. This transformation is embodied in the concept of twenty-first century learning (Care, Griffin, & Wilson, 2012). In line with 21st century skills, educators need to be creative and innovative, have flexible problem solving skills, and have the necessary communication and collaboration skills in workspaces and daily life (Lai & Viering, 2012). In 2015, Aydın suggested that parents and schools should prepare educational programs for students to acquire and develop digital citizenship education and 21st century skills within an ethical framework (Aydın, 2015). This view also supports the importance of the study.

While many areas such as business life, education life, etc. are gradually evolving into digital and individuals are evolving into digital citizenship in the 21st century, individuals need to have the life and career skills covered by 21st century skills in order to keep up with them. In addition, in order to keep up with the digital world, digital citizenship, that is, a brand new era, it is thought that 21st century skills should also have learning and renewal skills. Based on all these, it was wondered whether there is a relationship between the digital citizenship of pre-service teachers and their 21st century skills in the 21st century and in the digital age that we have adapted to without realizing it. For this reason, the general purpose of this study is to answer the question "Is there a significant relationship between preservice preschool teachers' digital citizenship and 21st century skills self-efficacy perceptions?".

Depending on the general purpose of the research, it seeks answers to the following sub-objectives

1. Is there a significant relationship between preservice preschool teachers' digital citizenship perception scores and their 21st Century Skills Self-Efficacy Perceptions scores?
2. Do preservice preschool teachers' perceptions of digital citizenship significantly predict their 21st Century Skills Self-Efficacy Perceptions?

2. Method

This section includes information on the research model and the study group, data collection tools, data collection, and data analysis.

2.1. Research Model

In this study, general survey method, one of the quantitative research methods, was used. In order to determine whether there is a significant relationship between pre-service teachers' 21st century skills and digital citizenship perception levels scores, the relational screening model, one of the general screening models, was used. According to Karasar, the relational screening model is defined as a screening approach that aims to determine the state of change between two or more variables (Karasar, 2020).

2.2. Population and Sample

In this study, general survey method, one of the quantitative research methods, was used. In order to determine whether there is a significant relationship between pre-service teachers' 21st century skills and digital citizenship perception levels scores, the relational screening model, one of the general screening models, was used. According to Karasar, the relational screening model is defined as a screening approach that aims to determine the state of change between two or more variables (Karasar, 2020).

2.3. Data Collection Tool and Data Collection

In the study, the following measurement tools were used as data collection tools;

- "Digital Citizenship Scale"
- "21st Century Skills Self-Efficacy Perception Scale"

A demographic information form was used by the researcher to determine the characteristics and demographic characteristics of pre-service preschool teachers.

Digital Citizenship Scale: The Digital Citizenship Scale was developed by Kuş, Güneş, Başarmak and Yakar in 2017 to determine the digital citizenship perceptions of the young generation, where the active use of the internet is the most common. The sample of the research consists of 438 young people between the ages of 16-24. The scale includes 49 items to measure individuals' perception of digital citizenship and There are 8 sub-dimensions. The scores that individuals can get vary between 49-245. The reliability coefficient for each factor of the scale was found to have values ranging from 0.733 to 0.829. According to Kuş, Güneş, Başarmak, & Yakar, the Digital Citizenship Scale is reliable (Kuş, Güneş, Başarmak, & Yakar, 2017).

21st Century Skills Self-Efficacy Perception Scale: 21st Century Skills Self-Efficacy Perception Scale was developed by Anagün, Atalay, Kılıç and Yaşar in 2016. It is a study to measure pre-service teachers' perceptions of 21st century skills. The scale consists of 42 items and three factors: Learning and Renewal Skills, Life and Career Skills, Information, Media and Technology Skills. The scores that individuals can get vary between 42-210. The reliability coefficient of the scale was determined as Cronbach α = .889. The 21st Century Skills Self-Efficacy Perception Scale is reported to be reliable by researchers (Anagün, Atalay, Kılıç, & Yaşar, 2016).

2.4. Data Analysis

The data on pre-service preschool teachers' digital citizenship skills and 21st century life skills self-efficacy perception were analyzed in IBM SPSS Statistics 22 program. Demographic information, frequency and percentage distributions of pre-service preschool teachers were prepared. Before analyzing the data obtained from the pre-service teachers participating in the study, Normality test was applied to determine whether the data showed normal distribution.

Table 1. Skewness and Kurtosis Values of Digital Citizenship Scale.

	N	Skewness	Kurtosis
Digital Citizenship	413	-.601	1.138

Looking at Table 1, it was seen that the skewness level was - 0.603 in the normality test performed on the data obtained on the digital citizenship skill levels of pre-service preschool teachers, that is, the distribution was normal. In examining the normal distribution of the data obtained in a study, the skewness value is examined. If the skewness coefficient values are between "-1 and +1", it indicates that the data scores exhibit a normal distribution (Büyüköztürk, 2007).

Table 2. Skewness and Kurtosis Values of 21st Century Skills Self-Efficacy Perception Scale.

	N	Skewness	Kurtosis
21st Century Skills	413	-.392	.127

When Table 2 is examined, it is seen that the skewness level is -.397 in the normality test performed on the data obtained on the preservice preschool teachers' 21st century life skills self-efficacy perception levels, that is, the distribution is normal. As a result of the analysis, since the skewness kurtosis values of this study were between -1 and +1, the ANOVA test was used in the analysis since the data were normally distributed.

Table 3. 21st Century Skills Self-Efficacy Perception and Digital Citizenship Scale Cronbach's Alpha Values.

Scales	N	A
21st Century Skills Self-Efficacy Perception Scale Total Score	413	.801
Digital Citizenship Scale Total Score	413	.764

George and Mallery stated in 2019 that the Cronbach's alpha (α) reliability coefficient should be above .70 for the scales to be appropriate and acceptable (George & Mallery, 2019). When Table 3 is examined, it is seen that the Cronbach's alpha (α) values of the scales are above .70 according to the reliability test results for this study. Accordingly, it can be stated that the Cronbach's alpha (α) reliability coefficient scores of the relevant scales are at an acceptable level.

2.5. Ethics

In the process of collecting data in the study, first of all, Necmettin Erbakan University Social and Human Sciences Scientific Ethics Committee (Date 19/03/2021/Decision No: 2021/140) necessary permissions were obtained. Correspondence was made with the owners of the measurement tools used in the study and necessary permissions were obtained.

3. Findings

This section includes the analysis of the data obtained with the data collection tools related to the problem statement and each sub-objective and the interpretation of the results of these analyzes. According to the research findings, 20.1% of the pre-service preschool teachers who participated in the study were in the first grade, 29.1% in the second grade, 21.1% in the third grade, and 29.8% in the fourth grade. The findings for the sub-objective "Is there a significant relationship between the Digital Citizenship perception scores of Preservice Preschool Teachers and their 21st Century Skills Self-Efficacy Perceptions scores?" are presented in the Table 4.

Table 4. Pearson Correlation Values Between Digital Citizenship and 21st Century Skills Self-Efficacy Perception Scores of Preservice Preschool Teachers.

	1	2	3	4	5	6	7	8	9	10	11	12	13
(1) Contact	1												
(2) Rights and Responsibility	.147**	1											
(3) Critical Thinking	.110*	.389**	1										
(4) Participation	.271**	.359**	.254**	1									
(5) Security	.037	.183**	.362**	.122*	1								
(6) Digital Skills	.260**	.542**	.393**	.210**	.179**	1							
(7) Ethics	.039	.433**	.383**	.195**	.354**	.402**	1						
(8) Trade	.340**	.444**	.340**	.319**	.149**	.592**	.254**	1					
(9) Digital Citizenship Scale Total Score	.407**	.740**	.679**	.552**	.485**	.718**	.602**	.713**	1				
(10) Learning and Renewal Skills	.143**	.320**	.250**	.263**	.194**	.285**	.204**	.319**	.408**	1			
(10) Learning and Renewal Skills	.143**	.320**	.250**	.263**	.194**	.285**	.204**	.319**	.408**		1		
(11) Life and Career Skills	.196**	.339**	.257**	.259**	.151**	.332**	.249**	.335**	.432**	.695**		1	
(12) Information Media and Technology Skills	.211**	.368**	.161**	.232**	.085	.426**	.186**	.384**	.418**	.559**	.604**		1
(13) 21 st Century Skills Self-Efficacy Perception Scale Total Score	.202**	.385**	.268**	.291**	.177**	.380**	.248**	.387**	.479**	.906**	.903**	.764**	1

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

When Table 5 is examined, it is seen that there is a very low positive correlation between Learning and Renewal Skills, which is the sub-dimension of 21st Century Skills Self-Efficacy Perception Scale, and Digital Citizenship Scale sub-dimensions of communication ($r=.143$, $p<.05$), security ($r=.194$, $p<.05$); rights and responsibility ($r=.320$, $p<.05$), critical thinking ($r=.250$, $p<.05$), participation ($r=.263$, $p<.05$), digital skills ($r=.285$, $p<.05$), ethics ($r=.204$, $p<.05$), commerce ($r=.319$, $p<.05$); there is a positive relationship between the total score of the digital citizenship scale ($r=.408$, $p<.05$).

21st Century Skills Self-Efficacy Perception Scale sub-dimension of life and career skills and Digital Citizenship Scale sub-dimensions of communication ($r=.196$, $p<.05$), security ($r=.151$, $p<.05$), critical thinking ($r=.257$, $p<.05$), participation ($r=.259$, $p<.05$), ethics ($r=.249$, $p<.05$), rights and responsibility ($r=.339$, $p<.05$), digital skills ($r=.332$, $p<.05$), trade ($r=.335$, $p<.05$), and digital citizenship scale total score ($r=.432$, $p<.05$). 21st Century Skills Self-Efficacy Perception Scale sub-dimension of information, media and technology skills and Digital Citizenship Scale sub-dimensions of critical thinking ($r=.161$, $p<.05$), ethics ($r=.186$, $p<.05$), communication ($r=.211$, $p<.05$), participation ($r=.232$, $p<.05$), rights and responsibility ($r=.368$, $p<.05$), trade ($r=.384$, $p<.05$), digital skills ($r=.426$, $p<.05$), and digital citizenship scale total score ($r=.418$, $p<.05$). There is no significant relationship between 21st Century Skills Self-Efficacy Perception Scale sub-dimension of information, media and technology skills and Digital Citizenship Scale sub-dimension of security ($r=.085$, $p<.05$).

“Do preservice preschool teachers' perceptions of digital citizenship significantly predict their 21st Century Skills Self-Efficacy Perceptions? “. The findings for the sub-objective are presented in the table below (Table 5).

Table 5. The Result of Simple Linear Regression Analysis for Predicting the Total Score of Preservice Preschool Teachers' 21st Century Skills Self-Efficacy Perception Level.

Predicted Variable	Predictor Variable	B	Standard Error	B	t	p
21 st Century Skills Self-Efficacy Perception otal Score	Fixed	61.804	9.896		6.25	.000
	Digital Citizenship Score	.579	.52	.479	11.057	.000

R=.479 R²=.229

F₍₁₋₄₁₁₎=122.267 p=0.00

According to the results of simple linear regression analysis, the total scores of the digital citizenship scale and the total scores of the 21st Century Skills Self-Efficacy Perception scale predicted significantly ($F_{(1-411)} = 122.267$, $p < .05$). The total scores of the digital citizenship scale explained 22% of the variance on the total scores of the 21st Century Skills Self-Efficacy Perception scale ($R^2 = .22$).

Table 6. The Result of Simple Linear Regression Analysis for the Prediction of the Total Score of Preservice Preschool Teachers' Learning and Renewal Skills Subdimension Level

Predicted Variable	Predictor Variable	B	Standard Error	B	t	p
Learning and Renewal Skills	Fixed	18.649	4.862		3.836	.000
	Digital Citizenship Total Score	.233	.026	.408	9.058	.000
R=.408 R ² =.166		$F_{(1-411)} = 82.056$ p=.000				

Table 6 shows that according to the results of simple linear regression analysis, the total scores of the digital citizenship scale and the total scores of the learning and innovation skills sub-dimension predicted the total scores at a significant level ($F_{(1-411)} = 82.056$, $p < .05$). The total scores of the digital citizenship scale explained 16% of the variance on the total scores of the learning and innovation skills subscale ($R^2 = .16$).

Table 7. Results of Simple Linear Regression Analysis for the Prediction of the Total Score of Preservice Preschool Teachers' Life and Career Skills Subdimension Level.

Predicted Variable	Predictor Variable	B	Standard Error	β	t	p
Life and Career Skills	Fixed	31.953	4.373		7.307	.000
	Digital Citizenship Total Score	.224	.023	.432	9.702	.000
R=.432 R ² =.186		$F_{(1-411)} = 94.127$ p=.000				

According to the results of simple linear regression analysis, the total scores of the digital citizenship scale significantly predicted the total scores of the life and career skills sub-dimension ($F_{(1-411)} = 94.127$, $p < .05$). The total scores of the digital citizenship scale explained 18% of the variance on the total scores of the life and career skills subscale ($R^2 = .18$).

Table 8. The Result of Simple Linear Regression Analysis for the Prediction of the Total Score of Preservice Preschool Teachers' Information, Media and Technology Skills Subdimension Level

Predicted Variable	Predictor Variable	B	Standard Error	B	t	p
Information, Media and Technology Skills	Fixed	11.202	2.462		4.549	.000
	Digital Citizenship Total Score	.121	.013	.418	9.325	.000
R=.418 R ² =.175		$F_{(1-411)} = 86.959$ p=.000				

Table 9 shows that according to the results of simple linear regression analysis, the total scores of the digital citizenship scale significantly predicted the total scores of the Information, Media and Technology Skills subscale ($F_{(1-411)} = 86.959$, $p < .05$). The total scores of the digital citizenship scale explained 17% of the variance on the total scores of the life and career skills subscale ($R^2 = .17$).

Table 9. Multiple Linear Regression Analysis Results for the Prediction of the Total Score of the 21st Century Skills Self-Efficacy Perception Scale.

Predicted Variable	Predictor Variable	B	Standard Error	B	t	p
21 st Century Skills Self-Efficacy Perception Scale Total Score	Fixed	63.723	10.645		5.986	.000
	Contact	.416	.371	.053	1.121	.263
	Rights and Responsibility	.755	.268	.160	2.816	.005*
	Critical Thinking	.166	.269	.032	.618	.537
	Participation	.765	.307	.122	2.496	.013*
	Security	.381	.286	.064	1.334	.183
	Digital Skills	.914	.441	.126	2.070	.03*
	Ethics	.210	.397	.028	.530	.596
	Trade	.800	.292	.157	2.738	.006*

*p<.05 R=.493 R²=.243 F₍₈₋₄₀₄₎ = 16.218

According to the results of the multiple regression analysis in Table 9, the sub-dimensions of the digital citizenship scale significantly predicted the total score of the 21st century skills self-efficacy perception scale ($F_{(8-404)}=16.218$, $p<.05$). The sub-dimensions of the digital citizenship scale explained 24% of the total score variance of the 21st century skills self-efficacy perception scale ($R^2=.24$).

When the results regarding the significance of the regression coefficients are examined, it is seen that the sub-dimensions of rights and responsibility ($\beta=.160$, $t=2.816$, $p<.05$), participation ($\beta=.122$, $t=2.496$, $p<.05$), digital skills ($\beta=.126$, $t=2.070$, $p<.05$), trade ($\beta=.157$, $t=2.738$, $p<.05$) are significant predictors of the total score of the 21st century skills self-efficacy perception scale. century skills self-efficacy perception scale total score. communication ($\beta=.053$, $t=1.121$, $p>.05$), critical thinking ($\beta=.032$, $t=.618$, $p>.05$), security ($\beta=.064$, $t=1.334$, $p>.05$), ethics ($\beta=.028$, $t=.530$, $p>.05$).

The 21st century skills self-efficacy perception scale was not found to be a significant predictor on the total score.

Table 10. Multiple Linear Regression Analysis Results for the Prediction of the Learning and Renewal Skills Subdimension.

Predicted Variable	Predictor Variable	B	Standard Error	B	t	p
Learning and Regeneration Skills	Fixed	20.077	5.250		3.824	.000
	Contact	.058	.183	.016	.315	.753
	Rights and Responsibility	.307	.132	.138	2.325	.021*
	Critical Thinking	.134	.133	.055	1.015	.311
	Participation	.368	.151	.124	2.436	.015*
	Security	.283	.141	.101	2.006	.045*
	Digital Skills	.179	.218	.052	.822	.412
	Ethics	.017	.196	.005	.087	.931
	Trade	.354	.144	.147	2.455	.015*

*p<.05 R=.418 R²=.175 F₍₈₋₄₀₄₎ = 10.701

When Table 10 is examined, according to the results of multiple regression analysis, the digital citizenship scale sub-dimensions significantly predicted the 21st century skills self-efficacy perception scale learning and renewal skills sub-dimension ($F_{(8-404)}=10.701$, $p<.05$). Digital citizenship scale sub-dimensions explained 17% of the variance on the 21st century skills self-efficacy perception scale learning and renewal skills sub-dimension ($R^2=.17$).

When the results regarding the significance of regression coefficients are analyzed, it is seen that the sub-dimensions of rights and responsibility ($\beta=.138$, $t=2.325$, $p<.05$), participation ($\beta=.124$, $t=2.436$, $p<.05$), security ($\beta=.101$, $t=2.006$, $p<.05$), trade ($\beta=.147$, $t=2.455$, $p<.05$) are significant on the learning and innovation skills sub-dimension of the 21st century skills self-efficacy perception scale.05), trade ($\beta=.147$, $t=2.455$, $p<.05$) sub-dimensions are significant predictors of the 21st century skills self-efficacy perception scale learning and renewal skills sub-dimension. Communication ($\beta=.016$, $t=.315$, $p>.05$), critical thinking ($\beta=.055$, $t=1.015$, $p>.05$), digital skills ($\beta=.052$, $t=.822$, $p>.05$), ethics ($\beta=.005$, $t=.087$, $p>.05$) sub-dimensions of 21st century skills self-efficacy perception scale were not found to be a significant predictor on learning and renewal skills.

Table 11. Multiple Linear Regression Analysis Results for the Prediction of Life and Career Skills Subdimension

Predicted Variable	Predictor Variable	B	Standard Error	B	t	p
Life and Career Skills	Fixed	32.211	4.727		6.815	.000
	Contact	.247	.165	.073	1.497	.135
	Rights and Responsibility	.261	.119	.128	2.190	.029*
	Critical Thinking	.125	.119	.056	1.049	.295
	Participation	.277	.136	.102	2.033	.043*
	Security	.085	.127	.033	.668	.504
	Digital Skills	.290	.196	.093	1.482	.139
	Ethics	.223	.176	.068	1.267	.206
	Trade	.271	.130	.124	2.091	.037*

* $p<.05$ $R=.439$ $R^2=.193$ $F_{(8-404)} = 12.081$

When Table 11 is examined, according to the results of multiple regression analysis, the sub-dimensions of the digital citizenship scale significantly predict the life and career skills sub-dimension of the 21st century skills self-efficacy perception scale ($F_{(8-404)}=12.081$, $p<.05$). The digital citizenship scale sub-dimensions explained 19% of the variance on the life and career skills sub-dimension of the 21st century skills self-efficacy perception scale ($R^2=.19$).

When the results regarding the significance of the regression coefficients are examined, it is seen that the sub-dimensions of rights and responsibility ($\beta=.128$, $t=2.190$, $p<.05$), participation ($\beta=.102$, $t=2.033$, $p<.05$), trade ($\beta=.124$, $t=2.091$, $p<.05$) are significant predictors of the life and career skills sub-dimension of the 21st century skills self-efficacy perception scale. Communication ($\beta=.073$, $t=1.497$, $p>.05$), critical thinking ($\beta=.056$, $t=1.049$, $p>.05$), safety ($\beta=.033$, $t=.668$, $p>.05$), digital skills ($\beta=.093$, $t=1.482$, $p>.05$), ethics ($\beta=.068$, $t=1.267$, $p>.05$) sub-dimensions of 21st century skills self-efficacy perception scale were not found to be a significant predictor on life and career skills.

Table 12. Multiple Linear Regression Analysis Results for the Prediction of the Information, Media and Technology Skills Subdimension

Predicted Variable	Predictor Variable	Standard Error				
		B		B	t	p
Information, Media and Technology Skills	Fixed	11.435	2.564		4.460	.000
	Contact	.112	.089	.059	1.248	.213
	Rights and Responsibility	.187	.065	.165	2.896	.004*
	Critical Thinking	-.093	.065	-.075	-1.444	.149
	Participation	.120	.074	.079	1.626	.105
	Security	.014	.069	.009	.197	.844
	Digital Skills	.444	.106	.254	4.181	.000*
	Ethics	-.030	.096	-.016	-.314	.753
	Trade	.175	.070	.143	2.485	.013*

*p<.05 R= .490 R²=.240 F₍₈₋₄₀₄₎ = 15.974

When Table 12 is examined, according to the results of multiple regression analysis, the digital citizenship scale sub-dimensions significantly predicted the 21st century skills self-efficacy perception scale information, media and technology skills sub-dimension ($F_{(8-404)}=15.974$, $p<.05$). Digital citizenship scale sub-dimensions explained 24% of the variance on the 21st century skills self-efficacy perception scale information, media and technology skills sub-dimension ($R^2=.24$).

When the results regarding the significance of the regression coefficients are examined, it is seen that the sub-dimensions of rights and responsibility ($\beta=.165$, $t=2.896$, $p<.05$), digital skills ($\beta=.254$, $t=4.181$, $p<.05$), commerce ($\beta=.143$, $t=2.485$, $p<.05$) are significant predictors of the information, media and technology skills sub-dimension of the 21st century skills self-efficacy perception scale. Communication ($\beta=.059$, $t=1.248$, $p>.05$), critical thinking ($\beta=-.075$, $t=-1.049$, $p>.05$), participation ($\beta=.079$, $t=1.626$, $p>.05$), security ($\beta=.009$, $t=.197$, $p>.05$), digital skills ($\beta=.254$, $t=4.181$, $p>.05$), ethics ($\beta=-.016$, $t=-.314$, $p>.05$) sub-dimensions were not found to be significant predictors of 21st century skills self-efficacy perception scale on information, media and technology.

3. Results and Discussion

In the study, Pearson Correlation Test was conducted to evaluate the significant relationship between Preservice Preschool Teachers' Digital Citizenship and 21st Century Skills Self-Efficacy Perception Scale total scores and sub-dimensions. The 21st Century Skills Self-Efficacy Perception Scale sub-dimension of learning and renewal skills and communication, security, critical thinking, participation, digital skills and ethics levels were found to have a significant positive relationship with low severity. A significant positive relationship was found between rights and responsibility, trade, and the total score of the digital citizenship scale. According to P21, it is stated that with the development of 21st century skills, students' effective communication and critical thinking skills can also improve. In addition, the success of students in today's world depends on communication and cooperation, problem solving and critical thinking skills. In addition, 21st century skills include financial literacy and civic literacy (knowing their rights and responsibilities at the universal and national level) (Partnership for 21st Century Learning, 2019). With this information, it can be said that the expectation is met from the data obtained. It is thought that as communication, cooperation, critical thinking, trade and rights and responsibilities, which are sub-dimensions of digital citizenship, develop, learning and renewal skills will also develop.

The 21st Century Skills Self-Efficacy Perception Scale revealed that there is a low level positive relationship between life and career skills, digital communication, security, critical thinking, participation, and ethics. In addition, a moderate

significant relationship was found between rights and responsibility, digital skills, trade and digital citizenship scale. According to P21, life and career skills include abilities such as flexibility and adaptability, entrepreneurship and self-management, social skills and leadership (Partnership for 21st Century Learning, 2019). In line with this information, based on the data, it can be said that as pre-service teachers' perceptions of their rights and responsibilities, digital skills, digital commerce and digital citizenship improve, their life and career skills can also improve. In addition, Erten (2019) did not find any significance between life and career skills and the variable of being dominant in information and communication technologies.

The 21st Century Skills Self-Efficacy Perception Scale revealed a low level significant relationship between the sub-dimension of information, media and technology skills and critical thinking, ethics, communication, participation skills; and a positive, moderate significant relationship between the total score of the scale of rights and responsibility, trade, digital skills, digital citizenship. According to P21, 21st century skills include information literacy, media literacy, information, communication and technology literacy (Partnership for 21st Century Learning, 2019). In addition, information literacy includes the skills of searching, finding and selecting information; higher order thinking skills such as decision making, problem solving, critical thinking; communication and collaboration skills; and information and media skills (Kurbanoğlu, 2010). Considering this information, the study explains the relationship between digital ethics, communication, participation skills, rights and responsibilities, trade digital skills and information, media and technology skills. Based on the literature and the data obtained, it can be said that with the development of pre-service teachers' digital citizenship levels, information, media and technology skills can also improve.

According to the results of the analysis, the most striking finding is that there is no significant relationship between the sub-dimension of the Digital Citizenship Scale, which is security, and the sub-dimension of the 21st Century Skills Self-Efficacy Perception Scale, which is information, media and technology skills. However, information, media and technology skills include information literacy. Solomon, Wilson, and Taylor (2012) say the following about information literacy; information literate people understand and comply with legal and ethical uses of information, as well as receiving information about security, follow legal and ethical guidelines for viewing and transmitting information. Information literate individuals are aware of common security issues faced by information users (Liu, et al., 2012). Based on this information, the fact that there is no relationship between security and information, media and technology skills in line with the data obtained from pre-service teachers shows that new research can be conducted with other variables.

According to the results of the simple linear regression analysis conducted in the study, the total scores of the Digital Citizenship Scale of pre-service teachers. 21st Century Skills Self-Efficacy Perception scale predicts the total scores at a significant level. In the literature review, 21st century skills are expected to enable people to react meaningfully to the changes taking place in the information age, to access the speed of technology, to be able to analyze and evaluate correctly by selecting the right information from the information community they reach rapidly, to transform this information into a product by using it correctly in their daily lives, and to have high-level skills and competencies along with these basic skills (Öğretir Özçelik & Eke, 2020). Ribble (2008) explains digital citizenship as follows; Digital citizens should act in accordance with ethical and legal behaviors by understanding the human, social and cultural problems brought by technology. In addition, they should advocate and practice the safe use of information and technology and awareness of legal responsibilities. They should lead lifelong learning, production, cooperation and digital citizenship by exhibiting a positive attitude while using technology (Ribble, 2008). Based on the literature review, it is possible to bring together the safe use of information and technology, which is a requirement of digital citizenship, and information, media and technology skills, which are a requirement of 21st century skills. In addition, while digital citizenship requires understanding human, social and cultural problems (Ribble, 2008), 21st century skills require understanding universal problems and cultures with global awareness and being aware of social problems with environmental literacy (Partnership for 21st Century Learning, 2019). With this information, a common light can be shed on digital citizenship and 21st century skills. While a digital citizen is expected to exhibit ethical and legal behavior and have digital rights and responsibilities (Ribble & Bailey, 2004), individuals with 21st century skills are expected to have civic literacy, that is, universal and global rights and responsibilities. The fact that there is an expectation of ethical behavior, rights and responsibilities in both concepts supports that the total scores of the Digital Citizenship Scale significantly predict the total scores of the 21st Century Skills Self-Efficacy Perception scale in the study. In addition, digital citizenship requires digital commerce, digital health, digital communication, while 21st century skills require financial literacy, health literacy, communication and collaboration. Based on all this information, it is possible to say that digital citizenship has a common denominator with 21st century skills. For this reason, it is thought that digital citizenship has an effect on the

perception of 21st century skills self-efficacy. According to the analysis results of the study conducted with pre-service teachers, it is possible to say that as pre-service teachers' perceptions of digital citizenship improve, their perceptions of 21st century skills self-efficacy will also improve. It is important to establish policies suitable for digital applications in higher education. These policies should have the core mission of not only explaining when and how to use technology effectively, but also exemplifying the norms and principles of digital citizenship (Al-Zahrani, 2015). Most children and young people need to be taught ethical and responsible ways of behaving when using the internet, especially since online information is there forever (Oxley, 2011). Zahrani (2015) stated that efforts should be made to raise awareness about digital citizenship, which is a global demand, and should also contribute to the development of digital citizenship by promoting respect for other cultures and digital identities. Moreover, since it is critical for students to be good digital citizens and use technology responsibly

Al-Zahrani (2015) stated that it is necessary to improve students' Internet attitude levels. He emphasized that the development of digital citizenship requires effective collaboration between educators, students, and the entire educational system to formulate effective codes of conduct and facilitate culturally appropriate behavior online (Nosko & Wood, 2011).

According to the results obtained; no significant relationship was found between the sub-dimension of the Digital Citizenship Scale, which is security, and the sub-dimension of the 21st Century Skills Self-Efficacy Perception Scale, which is information, media and technology skills. In addition, a significant relationship was found between Digital Citizenship perception and 21st Century Skills Self-Efficacy Perception total scores ($r=.479$, $p<.05$). In addition, it was revealed that the digital citizenship scale significantly predicted the 21st Century Skills Self-Efficacy Perception by explaining 22% of the variance on the total scores and the total scores of the 21st Century Skills Self-Efficacy Perception scale ($R^2=.22$).

According to the results obtained from the study data, the following recommendations are presented:

- In the new age of technology, pre-service teachers can be trained on the right digital citizenship and digital; rights and responsibility, communication, critical thinking, participation, safety, ethics, ethics, commerce and digital skills.
- In the new century, prospective teachers who will raise the new generation, new brains, that is, students, should have the knowledge and skills required by the century they are in. For this reason, pre-service teachers can be given trainings on 21st Century Skill.

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Conflict of Interest

it has been reported by the authors that there is no conflict of interest.

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