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Relationship between Social Studies Teacher Candidates' Digital Literacy Self-Efficacy Levels and Information and Communication Technology Competencies

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ABSTRACT

This research aims to determine the relationship between social studies teacher candidates' digital literacy self-efficacy levels and their information and communication technology competencies. The research was conducted using the relational survey model, which is one of the quantitative research methods. The study group of the research consists of 187 pre-service teachers (137 female and 50 male) studying in the 1st, 2nd, 3rd and 4th grades of Social Studies Education Department in the Faculty of Education at Niğde Ömer Halisdemir University. The data of the research were collected through "Digital Literacy Self-Efficacy Scale of Pre-Teacher Teachers" that was developed by Ocak and Karakuş (2018), a Personal Information Form that was prepared by the researchers and "Candidate Information and Communication Technologies Scale" that was developed by Tondeur et al. (2017) and adapted into Turkish by Gökçearslan et al. (2018). It was concluded that there is a positive, moderately significant relationship between social studies teacher candidates' information and communication technology competencies and digital literacy self-efficacy levels.

Key words: Social studies, Digital literacy, Information and communication technology

INTRODUCTION

Every change and transformation in technological developments due to especially the industrial revolution have evolved into a different dimension with the 21st century and led to the understanding of a process where digitalization comes to mind when it comes to technology. This situation has also changed both the human profile needed and the knowledge, skills and competencies to be acquired by individuals (Cansoy, 2018, p. 3114). Developments in Information and Communication Technologies (ICTs) have accelerated the transformation in the form and capacity of technology and paved the way for the presentation of media items used in education in a richer and more interactive manner (Çoban, 2020, p. 137). The use of information-communication technologies by integrating them into the educational environment is important in raising individuals who can keep up with the global world and in transforming into an information society by increasing the efficiency of learning-teaching processes (Çakır, 2013; Yeşiltaş & Kaymakçı, 2014, p. 317). At this point, one of the most important tasks falls on education. Because the knowledge, skills and competencies individuals acquire in the education process prepare them for life (Eryılmaz, 2018, p. 38). ICTs, which are among the relevant competencies, are defined as the correct and effective use of tools, equipment and media used to transmit, store, keep, produce, organize, reproduce and share information (Aydoğmuş & Karadağ, 2020, p. 687). The healthy progress of the process and the use of information - communication technologies in classroom activities have been effective in changing the functions expected from teachers as well (Adebayo, 2008). As vital stakeholders of education, it is a necessity that teachers should acquire the 21st Century skills such as knowledge, media and technology skills and develop a positive attitude on this issue for their professional developments (Akgün, 2020, p. 629; Oni et al., 2018, p. 47). Teachers should contribute to their professional and personal developments following the developments in ICTs as competent technology literates, prepare appropriate learning environments for students using these technologies, and ensure that students have competence in using technology resources (Turkish Ministry of National Education, 2006).

Teachers are required to follow technology closely so that they can communicate correctly with the new generation defined as digital natives, use teaching materials that may be of interest to them, and help them gain various skills. Considering that teachers act a crucial role in the adoption and implementation of new technologies raining teachers, training them is as important as equipping educational institutions with technological facilities (Akpınar, 2003, p. 79). Teachers and pre-service teachers must have digital literacy skills in order to keep up with information and communication technology, to catch up with technology, to select and

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evaluate the right information from the mass of information, and to use technology in teaching activities (Akpınar, 2003, p. 79; Anagün et al., 2016, p. 161; Aydoğmuş & Karadağ, 2020, p. 688). Gilster (1997) defines digital literacy as the ability of individuals to understand, interpret and analyze information presented in different formats from wide sources in the computer environment. Individuals with digital literacy skills are those who can access information correctly, analyze it and use it effectively (Kozan & Bulut-Özek, 2019, p. 108). It is the pre-service teachers' digital literacy skills that will enable them to prepare effective educational environments and contribute to the development of their students' lives and perspectives in the future (Ocak & Karakuş, 2018).

Digital literacy skills have become very important in education especially with the pandemic process. As in many countries throughout the world during the COVID-19 pandemic process, the education process has been transferred to the digital environment in our country as well (Kocaman-Karaoğlu et al., 2020, p. 156). The importance of teachers' competency at ICTs in terms of sustainable education has been understood once again. The fact that teacher candidates are equipped to access and use information effectively in the digital world is thought to contribute to the healthy progress of the education process in the future. Digital literacy is among the basic skills that should be acquired by students in Social Studies Education Programs (Turkish Ministry of National Education, 2018). Social studies teacher candidates should be digital literates and improve their competencies at ICTs so that they can make their students acquire digital literacy. The pre-service teachers are the directors of the social studies course, which has an important role in acquiring the digital literacy skills that are included as a skill in the 2018 curriculum for the first time. Therefore, it is believed that their possessing these skills will positively affect their careers as social studies teachers (Uslu et al., 2016). It is thought that such competencies of teacher candidates will also affect their careers positively.

There exist several studies on the information and communication technology competencies of pre-service teachers (Akgün, 2020; Aydın & Erol, 2021; Aydoğmuş & Karadağ 2020; Eryılmaz, 2018; Keleş, 2014; Şad & Nalçacı, 2015) and digital literacy self-efficacy (Ocak & Karakuş, 2019) in the related literature. However, there is no study aiming to examine the relationship between ICTs competency and digital literacy self-efficacy. Today, the development of individuals' digital literacy and ICT competencies is linked to internet access. Because smartphones, computers, social networks and search engines are among the main reference sources that help in mastering a subject or course (Ocaña-Fernández et al., 2020). According to studies, teachers are insufficient in using information and communication technologies (Kreijns et al., 2013). This result also reveals the importance of including information and communication technologies in teacher education. One of the biggest challenges in this regard is to ensure pedagogical innovation and to improve the correct use of ICTs because it is known that individuals without the necessary skills to use these technologies fall behind in adopting and using technology (Schreurs et al., 2017). The methodological knowledge needed to use information and communication technologies is accompanied by digital literacy skills (Gómez-Trigueros et al., 2019). Digital literacy skills support individuals in having the necessary scientific arguments about ICTs, thinking critically, researching new technologies, and acquiring affective skills (Aksoy, 2021). In brief, digital literacy skills and the use of ICTs mutually are thought to affect each other (Duran-Ruiz, 2009, Quintana & Pujol, 2010).

It is considered important to deal with the subject from a different perspective in order to fill the gap in the literature. In this context, the purpose of this study is to determine whether there is a relationship between the digital literacy self-efficacy levels of social studies teacher candidates (SSTC) and their ICT competencies. The research questions of the study are as follows:

1. Do social studies teacher candidates' digital literacy self-efficacies and their competencies at the ICTs differ in terms of gender?
2. Do social studies teacher candidates' digital literacy self-efficacies and their competencies at the ICTs differ in terms of the grade variable?
3. Do social studies teacher candidates' digital literacy self-efficacies and their competencies at the ICTs differ in terms of possessing a personal computer (PC)?
4. Do social studies teacher candidates' digital literacy self-efficacies and their competencies at the ICTs differ in terms of using social networks?

METHOD

Model of the Research

In this study, descriptive survey model, one of the quantitative research methods, was used. According to Karasar (2012), descriptive survey models aim to describe a past or current situation as it exists and define the individual or object subject to research as it is in its own conditions.

Study Group

The study group of the research consists of 187 (137 Female, 50 Male) students studying at the 1st, 2nd, 3rd and 4th grades of the Department of Social Sciences Education at the Turkish and Social Sciences Department at Niğde Ömer Halisdemir University. The study was carried out in line with the permission obtained with the decision of Niğde Ömer Halisdemir University Registrar's Office dated 08/02/2021 and numbered E-69972237-302.08.01-17975. Data on the demographic characteristics of the participants, who took part in the study on voluntary basis, are included in Table 1.

According to the figures in Table 1, it is seen that 73.3% of the participants in the study were female while 26.7% were male teacher candidates. The table also reveals that 23.5%, 28.3%, 31% and 17.1% of the participants were studying at 1st, 2nd, 3rd and 4th or over grades respectively.

Data Collection

The data were collected through "Pre-service Teachers' Digital Literacy Self-Efficacy Scale" developed by Ocak

Table 1. Demographic characteristics of the participants

Demographic Characteristics		f	%
Gender	Female	137	73.3
	Male	50	26.7
Grade	1st	44	23.5
	2nd	53	28.3
	3rd	58	31.0
	4th or over	32	17.1

and Karakuş (2018), "The Scale of Preservice Teachers' ICT Competencies in Education" developed by Tondeur et al. (2017) and adapted into Turkish by Gökçearslan et al. (2018) Competence Scale" and a Personal Information Form developed by the researchers.

The Pre-service Teachers' Digital Literacy Self-Efficacy Scale is a 5-point Likert-type scale rated as 'Never', 'Seldom', 'Sometimes', 'Frequently' and 'Always'. It consists of 35 items and 4 factors which are named as 'Production' (11 items)", 'Resource Utilization' (10 items), 'Application Usage' (9 items) and 'Support' (5 items).

The Turkish version of the Scale of Preservice Teachers' ICT Competencies in Education consists of 16 items and 2 factors. The scale is a 5-point Likert-type one rated as 'Absolutely Disagree', 'Disagree', 'Undecided', 'Agree' and 'Strongly Agree'. The first factor, which is named as ICT Competence Pupil Use (ICTC-PU), consists of the first 9 items in the scale and refers to the 'preservice teachers' competencies to support pupils for ICT use in class'. The second factor, which is named as ICT Competence Instructional Design (ICTC-ID), is comprised of the remaining 7 items that represent 'pre-service teachers' competencies to use ICT for instructional design'.

The reliability of the data collection tools were calculated with the Cronbach Alpha coefficient. While the Cronbach-Alpha coefficient of the Pre-service Teachers' Digital Literacy Self-Efficacy Scale is .96 in the overall scale, the Cronbach-Alpha coefficients for the Production, Resource Utilization, Application Usage and Support factors are calculated as .90, .88, .86 and .96 respectively.

The Cronbach's Alpha coefficient value of the Scale of Preservice Teachers' ICT Competencies in Education is. 94 for the whole scale. On the other hand, the Cronbach Alpha coefficients of the Instructional Design and Support of the Usage factors are found as .88 and .92 respectively. The figures regarding the Cronbach's Alpha internal consistency of the scales are presented in Table 2.

According to the findings presented in Table 2, it can be stated that both The Digital Literacy Self-Efficacy Scale and The Scale of Preservice Teachers' ICT Competencies in Education are reliable. According to Büyüköztürk (2011), for a scale to be accepted as reliable, the internal consistency coefficient of the scale must be ≥ .70 (Büyüköztürk, 2011).

Data Analysis

In this study, which is based one basis of descriptive survey model, the scores of social studies teacher candidates from The Digital Literacy Self-Efficacy Scale and The Scale of Preservice Teachers' ICT Competencies in Education were analyzed. The data obtained from the scales were analyzed through IBM SPSS 24.0 and the significance level was accepted as p≤.05 in all analyses.

Whether or not the research data fit the normal distribution was tested through normal distribution analyses. In this context, average score, minimum and maximum score range, skewness and kurtosis coefficients were calculated. In addition, Kolmogorov-Smirnov normality test was performed (Tabachnick & Fidell, 2013).

Seeing that the data showed normal distribution, we analyzed the data to address our research questions through the Independent Samples t-Test and One-Way Analysis of Variance (One-Way ANOVA). In the event that statistically significant differences emerged as a result of the analysis, the homogeneity of the variances was checked to reveal between which groups these differences occurred, and the Bonferroni test was used in homogeneity case of homogeneity of the variances. The data regarding the normality test of the scales are shown in Table 3.

Table 3. Skewness and kurtosis results for the pre-service teachers' digital literacy self-efficacy scale and the scale of preservice teachers' ICT competencies in education

As a result of the skewness and kurtosis test regarding Pre-service Teachers' Digital Literacy Self-Efficacy Scale and The Scale of Preservice Teachers' ICT Competencies in Education, it was determined that the distribution showed normality. Considering that the skewness and kurtosis values for normal distribution should be +/- 1 (Leech et al., 2015, pp. 22-23), it can be stated that the distribution is normal.

The arithmetic mean scores of the social studies teacher candidates' answers to the questions in the "Pre-service Teachers' Digital Literacy Self-Efficacy Scale" were based on the following ranges: Never ($1.00<\leq1.79$), Rarely ($1.80<\bar{x}\leq2.59$), Occasional ($2.60<\bar{x}\leq3.39$), Frequently ($3.40<\bar{x}\leq4.19$), Always ($4.20<\bar{x}\leq5.00$).

In the calculation of the arithmetic mean scores of the social studies teacher candidates' responds to the " The Scale of Preservice Teachers' ICT Competencies in Education", the following ranges were taken as a basis: Strongly disagree ($1.00<\bar{x}\leq1.79$), Disagree ($1.80<\bar{x}\leq2.59$), Undecided ($2.60<\bar{x}\leq3.39$), Agree ($3.40<\bar{x}\leq4.19$), Strongly Agree ($4.20<\bar{x}\leq5.00$).

FINDINGS AND INTERPRETATION

The objective of the current study was to examine the relationship between digital literacy self-efficacy and information and communication technology competencies of social studies teacher candidates. Table 4 shows the results of the correlation tests between the teacher candidates' digital literacy self-efficacy scale and the scale of preservice teachers' ICT competencies in education.

It can be stated that there is a moderately significant positive and moderate relationship between the digital literacy self-efficacies and the ICT competencies of social studies teacher candidates in terms of the factors and the total scores of the scales (r =.000<.655). Based on this finding of the

Table 2. The Cronbach's Alpha internal consistency of the pre-service teachers' digital literacy self-efficacy scale and the scale of preservice teachers' ICT competencies in education

Scale	Factor	Cronbach's Alpha	Number of Items
The Pre-service Teachers' Digital Literacy Self-Efficacy Scale	Production	0.81	11
	Resource Utilization	0.90	10
	Application Usage	0.86	9
	Support	0.85	5
	Total	0.94	35
The Scale of Preservice Teachers' ICT Competencies in Education	ICTC-PU	0.89	9
	ICTC-ID	0.84	7
	Total	0.82	16

Table 3. Skewness and kurtosis results for the pre-service teachers' digital literacy self-efficacy scale and the scale of preservice teachers' ICT competencies in education

Scale	Skewness		Kurtosis	
	s	ss	s	ss
The Pre-service Teachers' Digital Literacy Self-Efficacy Scale	-0.420	0.178	-0.420	0.354
The Scale of Preservice Teachers' ICT Competencies in Education	0.150	0.178	0.744	0.354

study, it can be claimed that digital literacy self-efficacy improves information and communication technology competencies positively.

The results of the analysis conducted in order to reveal the relation between the genders of social studies teacher candidates and their digital literacy self-efficacy are given in Table 5. The findings in Table 5 indicate that no statistically significant difference exists between the digital literacy self-efficacy of social studies teacher candidates in terms of gender in Production [$t_{(185)}$=.080;p>.05], Using Resources [$t_{(185)}$=.309;p>.05], Using Application [$t_{(185)}$=1.877;p>.05], Support [$t_{(185)}$=.096;p>.05] factors and the overall scale [$t_{(185)}$=.560;p>.05]. In the light asserted finding, it can be asserted that the gender of social studies teacher candidates does not have an effect on their digital literacy self-efficacy levels.

The results of the analysis done to reveal the relation between the gender of social studies teacher candidates and their competency in ICTs are given in Table 6. The figures show that there is no statistically significant difference between ICTs competency and gender in the Support of the Usage (ICTC-PU) [$t_{(185)}$=1.053;p>.05] and the Instructional Design (ICTC-PU) factors [$t_{(185)=.}$703;p>.05] and the overall scale [$t_{(185)}$=.960;p>.05] in terms of gender. This finding indicates that the gender of social studies teacher candidates does not have an effect on their ICTs competencies.

The results of the One-Way ANOVA test, conducted to reveal the relation between social studies teacher candidates' grade levels and digital literacy self-efficacy, are given in Table 7. It is understood from these findings that there aren't any statistically significant differences between the digital literacy self-efficacy of social studies teacher candidates and their grade levels in the Production [$F_{(3-183)}$=1.123;p>.05], Resource Utilization [$F_{(3-183)}$=1.680;p>.05], Application Usage [$F_{(3-183)}$=1.375;p>.05], Support [$F_{(3-183)}$=.762;p>.05] factors and the overall scale [$F_{(3-183)}$=1.492;p>.05]. The finding reveals that the grade levels of social studies teacher candidates do not affect digital literacy self-efficacy levels.

The results of the one-way analysis of variance (One-Way ANOVA) test conducted in order to find out the relation between the grade levels of social studies teacher candidates and their ICT competencies are given in Table 8. The findings show that no statistically significant difference exists between the social studies teacher candidates' grade levels and ICT competencies in Support of the Usage (ICTC-PU) [$F_{(3-183)}$=2.161;p>.05] and Instructional Design (ICTC-ID) [$F_{(3-183)}$=2.080;p>.05]factors and the overall scale [$F_{(3-183)}$=2.380;p>.05] in terms of grade variable. Based on this finding of the study, it can be stated that the grade level of social studies teacher candidates does not have an effect on their ICT competencies.

The results of the independent t-test analysis made in order to reveal the relation between the social studies teacher candidates' possessing a PC and their digital literacy self-efficacy are given in Table 9. Based on the findings in the table, no statistically significant difference is seen between the digital literacy self-efficacy of social studies teacher candidates in the Production [$t_{(185)}$=1.722;p>.05] and Application Usage [$t_{(185)}$=1.865;p>.05] factors in terms of the possessing a PC variable. On the other hand, a statistically significant difference is found in the Resource Utilization [$t_{(185)}$=2.208;p≤.05] and Support [$t_{(185)}$=2.340;p≤.05] factors and the overall scale [$t_{(185)}$=2.346;p≤.0]. It has been found that this difference is in favor of pre-service teachers who own a PC. It can be stated that teacher candidates who own a PC can use the resources provided in the digital environment and that they use these resources as a supportive element in the teaching process.

The results of the analysis made in order to reveal the relationship between social studies teacher candidates' competencies in ICT in terms of possessing a PC are given in Table 10. According to the findings in the table, there is no statistically significant difference between the ICT competencies of social studies teacher candidates in terms of their possessing a PC in the Support of the Usage (ICTC-PU) [$t_{(185)}$=.744;p>.05] and Instructional Design (ICTC-ID) [$t_{(185)}$=1.195;p>.05] factors and the overall scale

Table 4. Pearson correlation coefficients for the relationship between the teacher candidates' digital literacy self-efficacy scale and the scale of preservice teachers' ICT competencies in education

	Support of the Usage (ICTC-PU)	Instructional Design (ICTC-ID)	The Scale of Preservice Teachers' ICT Competencies in Education (Total)
Production	0.542**	0.504**	0.565**
Resource Utilization	0.545**	0.416**	0.523**
Application Usage	0.510**	0.515**	0.552**
Support	0.531**	0.552**	0.583**
The Pre-service Teachers' Digital Literacy Self-Efficacy Scale (Total)	0.628**	0.584**	0.655**

**p<.01

Table 5. Independent t-test results regarding the mean scores of the pre-service teachers' digital literacy self-efficacy scale in terms of gender

Factor	Gender	n	$\bar{X}$	SD	df	t	p
Production	Female	137	40.50	7.85	185	0.080	0.937
	Male	50	40.60	7.92			
Resource Utilization	Female	137	43.55	5.71	185	0.309	0.757
	Male	50	43.26	5.92			
Application Usage	Female	137	30.72	7.11	185	1.877	0.062
	Male	50	32.94	7.27			
Support	Female	137	18.85	4.20	185	0.096	0.923
	Male	50	18.78	4.16			
The Pre-service Teachers' Digital Literacy Self-Efficacy Scale (Total)	Female	137	133.62	20.49	185	0.560	0.576
	Male	50	135.58	22.98			

Table 6. Independent t-test results regarding the mean scores of the scale of preservice teachers' ICT competencies in education in terms of gender

Factor	Gender	n	$\bar{X}$	SD	df	t	p
Support of the Usage (ICTC-PU)	Female	137	38.64	4.48	185	1.053	0.294
	Male	50	37.88	4.09			
Instructional Design (ICTC-ID)	Female	137	28.80	3.94	185	0.703	0.483
	Male	50	28.36	3.45			
The Scale of Preservice Teachers' ICT Competencies in Education (Total)	Female	137	67.45	7.85	185	0.960	0.388
	Male	50	66.24	6.85			

[$t_{(185)}$=1.029;p>.05]. In this context, it can be stated that possessing a PC does not have an effect on social studies teacher candidates' ICT competencies.

The results of the analysis made in order to reveal the situation between the social studies teacher candidates' use of social networks and their digital literacy self-efficacy are presented in Table 11. The figures in the table indicate that there is no statistically significant difference between the digital literacy self-efficacy of social studies teacher candidates in terms of their use of social networks variable in the Support factor [$t_{(185)}$=1.899;p>.05]. On the other hand, a statistically significant difference is found in the Production [$t_{(185)}$=3.091;p≤.05], Resource Utilization [$t_{(185)}$=3.399;p≤.05] and Applications Usage [$t_{(185)}$=2.811;p≤.05] factors and the overall scale [$t_{(185)}$=3.430;p≤.05]. It is found that the difference is in favor of pre-service teachers who use social networks.

The results of the independent t-test analysis to test the relationship between the social studies teacher candidates' use of social networks and their ICT competencies are included in Table 12. It can be seen from the findings in the table that there is no significant difference between the ICT competencies of social studies teacher candidates in terms of their use of social networks in the Supporting Usage [$t_{(185)}$=.817;p>.05] and Instructional Design [$t_{(185)}$=.773;p>.05] factors and the overall scale [$t_{(185)}$=.859;p>.05]. Thus, it can be asserted that using social networks does not affect social studies teacher candidates' ICT competencies.

DISCUSSION

Information and Communication Technologies (ICT), which we use extensively in many areas such as health, economy, politics, communication and education, improve our living

Table 7. One-way ANOVA results regarding the mean scores of the pre-service teachers' digital literacy self-efficacy scale grade variable

Factor	Grade	n	$\bar{X}$	SD		ss	df	ms	F	p
Production	1	44	39.55	8.50	Between Groups	206.972	3	68.991	1.123	0.341
	2	53	41.17	8.07	Within Groups	11243.670	183	61.441		
	3	58	39.69	7.34	Total	11450.642	186			
	4 and over	32	42.31	7.37						
Resource Utilization	1	44	42.43	6.85	Between Groups	165.022	3	55.007	1.680	0.173
	2	53	44.43	5.72	Within Groups	5993.619	183	32.752		
	3	58	42.78	5.41	Total	6158.642	186			
	4 and over	32	44.59	4.41						
Application Usage	1	44	31.43	7.29	Between Groups	212.487	3	70.829	1.375	0.252
	2	53	31.62	6.65	Within Groups	9427.898	183	51.519		
	3	58	29.97	6.29	Total	9640.385	186			
	4 and over	32	33.09	9.13						
Support	1	44	18.98	4.15	Between Groups	40.003	3	13.334	0.762	0.517
	2	53	19.17	3.93	Within Groups	3202.521	183	17.500		
	3	58	18.16	3.87	Total	3242.524	186			
	4 and over	32	19.28	5.09						
The Pre-service Teachers' Digital Literacy Self-Efficacy Scale (Total)	1	44	132.39	23.31	Between Groups	1983.453	3	661.151	1.492	0.218
	2	53	136.40	19.56	Within Groups	81119.649	183	443.277		
	3	58	130.59	19.24	Total	83103.102	186			
	4 and over	32	139.28	23.26						

Table 8. One-way ANOVA results regarding the mean scores of the scale of preservice teachers' ICT competencies in education in terms of grade variable

Factor	Grade	n	$\bar{X}$	SD		ss	df	ms	F	p
Support of the Usage (ICTC-PU)	1	44	38.64	5.21	Between Groups	122.170	3	40.723	2.161	0.094
	2	53	38.25	4.21	Within Groups	3447.872	183	18.841		
	3	58	37.60	3.89	Total	3570.043	186			
	4 and over	32	40.00	3.99						
Instructional Design (ICTC-ID)	1	44	29.18	4.56	Between Groups	88.964	3	29.655	2.080	0.104
	2	53	28.72	3.24	Within Groups	2609.421	183	14.259		
	3	58	27.76	3.56	Total	2698.385	186			
	4 and over	32	29.63	3.81						
The Scale of Preservice Teachers' ICT Competencies in Education (Total)	1	44	67.82	9.23	Between Groups	402.805	3	134.268	2.380	0.071
	2	53	66.96	6.70	Within Groups	10325.367	183	56.423		
	3	58	65.36	6.79	Total	10728.171	186			
	4 and over	32	69.63	7.42						

standards and provide great convenience in saving time. For this reason, many activities and processes are carried out in digital environment. Digital resources are highly preferred especially at the point of accessing information and information-communication technologies (ICTs) are used. Individuals' ICT competency levels help individuals save time in accessing information, access reliable resources and store the accessed resources. In other words, it can be stated that the development of individuals' digital literacy self-efficacy levels and ICT competencies affect each other. The result of this study support the view that there is a positive medium-level significant relationship between the ICT competencies of social studies teacher candidates and their digital literacy self-efficacy levels. Özel (2013), while evaluating basic digital literacy characteristics and skills, emphasized the need for individuals to have the necessary technical knowledge to access, evaluate, reconstruct and share information with other individuals using digital media and tools. From this statement, it is understood that there is a reciprocal relationship between the development of digital literacy self-efficacy and ICTs competency, which coincides with the result of this study.

Table 9. Independent t-test results regarding the mean scores of the pre-service teachers' digital literacy self-efficacy scale in terms of possessing a PC variable

Factor	Have you got a PC?	n	$\bar{X}$	SD	df	t	p
Production	Yes	107	41.37	7.44	185	1.722	0.087
	No	80	39.39	8.27			
Resource Utilization	Yes	107	44.27	5.32	185	2.208	0.028*
	No	80	42.41	6.17			
Application Usage	Yes	107	32.16	7.36	185	1.865	0.064
	No	80	30.19	6.86			
Support	Yes	107	19.44	4.30	185	2.340	0.020*
	No	80	18.01	3.87			
The Pre-service Teachers' Digital Literacy Self-Efficacy Scale (Total)	Yes	107	137.24	20.79	185	2.346	0.020*
	No	80	130.00	21.01			

*p≤0.05

Table 10. Independent t-test results regarding the mean scores of the scale of preservice teachers' ICT competencies in education in terms of possessing a PC variable

Factor	Have you got a PC?	n	$\bar{X}$	SD	df	t	p
Support of the Usage (ICTC-PU)	Yes	107	38.64	4.09	185	0.744	0.458
	No	80	38.16	4.76			
Instructional Design (ICTC-ID)	Yes	107	28.97	3.92	185	1.195	0.234
	No	80	28.30	3.64			
The Scale of Preservice Teachers' ICT Competencies in Education (Total)	Yes	107	67.62	7.55	185	1.029	0.305
	No	80	66.46	7.65			

Table 11. Independent t-test results regarding the mean scores of the pre-service teachers' digital literacy self-efficacy scale in terms of the using social networks variable

Factor	Do you use social networks?	n	$\bar{X}$	SD	df	t	p
Production	Yes	181	40.84	7.76	185	3.091	0.002*
	No	6	31.00	3.16			
Resource Utilization	Yes	181	43.73	5.58	185	3.399	0.001*
	No	6	35.83	6.08			
Application Usage	Yes	181	31.58	7.14	185	2.811	0.005*
	No	6	23.33	3.88			
Support	Yes	181	18.93	4.16	185	1.899	0.059
	No	6	15.67	3.72			
The Pre-service Teachers' Digital Literacy Self-Efficacy Scale (Total)	Yes	181	135.08	20.69	185	3.430	0.001*
	No	6	105.83	14.86			

*p≤0.05

Table 12. Independent t-test results regarding the mean scores of the scale of preservice teachers' ICT competencies in education in terms of the using social networks variable

Factor	Do you use social networks?	n	$\bar{X}$	SD	df	t	p
Support of the Usage (ICTC-PU)	Yes	181	38.49	4.39	185	0.817	0.415
	No	6	37.00	4.15			
Instructional Design (ICTC-ID)	Yes	181	28.72	3.85	185	0.773	0.440
	No	6	27.50	2.35			
The Scale of Preservice Teachers' ICT Competencies in Education (Total)	Yes	181	67.21	7.66	185	0.859	0.391
	No	6	64.50	5.01			

In this study, a statistically significant difference does not exist between social studies teacher candidates' digital literacy self-efficacy levels or their ICT competencies. Finding a similar result, Yeşiltaş and Sönmez (2014) define technology as the work of applying scientific data to life to facilitate people's lives and solve their problems. Therefore, every individual, whether male or female, actively uses technology and technological equipment in their lives. In this context, it can be stated that gender does not have any effect on digital literacy self-efficacy and ICT competency, and it can be stated that social studies teacher candidates of both genders use technological equipment equally. Similarly, it was concluded that there was no statistically significant difference between individuals' ICTs competencies in terms of gender in the studies conducted by Akgün (2020), Aydoğmuş and Karadağ (2020) and Şad and Nalçacı (2015) as well. Also, no statistically significant difference was found in the overall scale and the sub-factors with the exception of the Application Usage factor in the study conducted by Ocak and Karakuş (2019). In the study, a significant difference was found between the digital literacy self-efficacy level in the application usage factor and it was seen that the difference was in favor of male pre-service teachers.

The emergence of computer technology is one of the greatest advances in technology. Another important development that follows it is undoubtedly internet technology. Computer and internet technology has made great progress over time and has an extremely important place in our lives. As in all areas of life, there are computer and internet-based trainings in educational institutions to meet the needs of qualified people. Computer courses are included in the instructional programs of many faculties of universities. Similarly, computer training is provided for teacher candidates in the faculties of education as well. With these trainings, it is aimed that teacher candidates are technologically equipped. In this study, it is concluded that the grade levels of social studies teacher candidates have an effect on their neither digital literacy self-efficacy levels nor ICT competencies. The idea that the new generation studying in higher education institutions are familiar with using technological facilities regardless of their grade levels may be the reason why there is no significant difference in terms of grade variable. Erten (2019) states that the young generation, who is defined as Generation-Z today, is a generation whose lifestyles are so based on technology that they use social media productively and they are capable of using technological opportunities to solve their problems.

Today, smartphones and tablets can offer many services offered by computers. Despite this, computers are preferred more because they are more practical than other technological equipment in the use of many programs. Nowadays, computer is used extensively in accessing sources of information and in transforming the information obtained from these sources into a support element. For example, computers offer teachers great opportunities in transferring the digitally obtained information to a presentation file or organizing the information into a material to be used in the education and training process. Coinciding with this reality, it is also found in this study that the digital literacy self-efficacy levels of social studies teacher candidates who have a PC are higher in the Resource Utilization and Support factors and the overall scale compared to pre-service teachers who do not possess a PC. Usta and Korkmaz (2010) state that providing pre-service teachers with computer skills increases the quality of the educational system. In this context, it can be claimed that having a PC will contribute to the development of digital literacy self-efficacy levels of social studies teacher candidates by improving their computer skills. With a similar result in their study, Ocak and Karakuş (2019) also concluded that there was a significant difference in favor of those who have computer access. In the study, it was concluded that there was no statistically significant difference between the ICT competencies of social studies teacher candidates and their possessing a PC, which indicates that possessing a PC does not have affect their ICT competencies. This is thought to result from the fact that ICTs include many other equipment such as tablets, smartphones, web, etc. besides computers and that possessing a PC is not sufficient alone to have ICT competency. Similarly, Aydoğmuş and Karadağ (2020) also concluded that possessing a PC does not have an impact on ICT competencies.

Today, apart from their entertainment and communication functions, the effect of social networks on information sharing is also increasing day by day. An event that occurs in social life or an innovation in the scientific field is learned much faster through social networks. Because social networks provide their users with an internet experience based on participation, enabling the information to spread faster (Uslu & Hamarat, 2016, p. 27). Individuals are able to develop their skills in generating information, accessing information sources and using applications through social networks. In this study, it was concluded that social studies teacher candidates who use social networks have higher levels of digital literacy self-efficacy in the factors of generating knowledge, resource utilization and application usage and in general in the scale compared to those who do not use social networks. In line with this finding, it can be stated that social networks have a positive effect on the development of digital literacy self-efficacy levels of teacher candidates. Similarly, in the study conducted by Uslu and Hamarat (2016), the recommendation of "conducting studies to increase the use of social networks for education at every grade level for teacher candidates" highlights the importance of social networks in accessing to information and using it. Akın et al. (2013) emphasize that social networks support fast and easy communication and offer various opportunities for learning individually and in groups. In the literature, it is stated that social networks have an important place in terms of accessing to, producing and sharing information, and serve a great variety of purposes in educational processes (Durak & Seferoğlu, 2016; Gülbahar et al., 2010; Uça-Güneş, 2016). In this context, it is clear that social networks have an important potential for education. It was concluded that there is no statistically significant difference between social studies teacher candidates' use of social networks and their ICT competency levels. This result indicates that using social networks does not have an impact on ICT competence levels. Use of social

networking does not require a high level of technological skills. In other words, any individual who has the ability to use basic technological equipment can easily use social networks, which is thought to explain why no significant difference was found in this study between social studies teacher candidates' use of social networks and their ICT competency levels.

Considering the rapid changes in the profile of qualified people and technology in the 21st century, it can be stated that the societies that will shape the future are those that raise individuals who use technology efficiently. In this context, it is extremely important for social studies teacher candidates who will raise the generations of the future to get away from traditional educational technologies and have knowledge about modern educational technologies.

CONCLUSIONS AND RECOMMENDATIONS

In this study, it was concluded that there is a positive and moderately significant relationship between the ICT competencies of social studies teacher candidates and their digital literacy self-efficacy levels. It can be stated that the equal use of technological equipment by male and female social studies teacher candidates explains why the gender variable does not have any effect on digital literacy self-efficacy and ICT competencies. Another conclusion that can be made based on the result of the current study is that the classroom levels of social studies teacher candidates do not have an effect on their digital literacy self-efficacy levels and their ICT competencies. Our results showed that the digital literacy self-efficacy levels of the teacher candidates who have a personal computer in the scale are higher than those of the teacher candidates who do not have a personal computer. In addition, no statistically significant difference was reported between the ICT competencies of social studies teacher candidates and their status of owning a personal computer. As it was also evident from the analysis of our data, the digital literacy self-efficacy levels of the pre-service teachers, who use social networks, are higher in the scale compared to those who do not use social networks. Finally, no statistically significant difference was observed between the social studies teacher candidates' use of social networks and their ICT competency levels.

As a result, considering the relationship between ICT competency and digital literacy self-efficacy, it is recommended that higher education institutions should provide more ICT-based educational activities in their instructional programs. The study has shown that social networks have a positive effect on the development of digital literacy self-efficacy levels of teacher candidates. Therefore, it is recommendable that Social Studies Teaching programs should offer students educational activities that will provide them with extensive knowledge and skills about how to reach knowledge through social networking sites. Also, further quantitative, qualitative or mixed-method researches should be conducted with different samplings so that the issue could be examined more comprehensively, which will also make an invaluable contribution to the related literature.

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