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Examining digital data security awareness of social studies teacher candidates according to various variables[1]

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Abstract

The main purpose of the study is to examine the digital data security awareness of social studies teacher candidates according to various variables. In accordance with the main purpose of the study, the digital data security awareness levels of social studies teacher candidates were determined and it was also tried to determine whether there is a significant difference according to gender, grade level, average daily computer usage time and average daily social media usage time variables. The survey model, one of the quantitative research methods, was adopted in the study. 384 social studies teacher candidates studying at 15 different state universities in Türkiye participated in the study. The Digital Data Security Awareness Scale was used as a data collection instrument. Descriptive statistics, independent samples t-test and one-way ANOVA were performed to analyze the data. The findings indicated that social studies teacher candidates exhibited notably high levels of awareness regarding digital data security. The analysis also revealed significant differences in digital data security awareness among social studies teacher candidates according to gender and avarage daily computer usage time. However, no significant differences were found according to the grade level and avarage daily social media usage tme. Based on the results of the study, one of the primary recommendations is to provide social studies teacher candidates additional opportunities to interact with computers during their pre-service education.

1 Introduction

Almost every area of life is being influenced by the digital transformation. Particularly in the recent decade, developments in technology have prompted a boost in digital products and their range, which has accelerated digitalization across a wide variety of industries, including communication, education, and sports. As a result of this transformation, digital data production has increased dramatically. Particularly, the exponential growth in social media platforms and their use by large masses has made digitalization an integral part of life (Arat & Aslan, 2021). According to the report

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published by Hootsuite (2021), as of October 2021, 66.6% of the world population of 7.83 billion uses a telephone and 59.5% uses the internet. 91.5% of internet users access the internet via their smartphones and spend an average of 6 hours and 54 minutes daily on the internet. Furthermore, 76.8% of internet users shop via online platforms. The same report stated that 77.7% of the population of Türkiye, which is among the developing countries, can access the internet and spends 7 hours and 57 minutes of their daily time on the internet. When the report is examined, it is apparent that the Turkish average is above the global average in numerous activities including internet and digital tools, such as social media usage, mobile banking usage, and online shopping (Hootsuite, 2021). This published report demonstrates that the majority of people in the world are intertwined with digital life and that individuals in Türkiye generates more digital data than many other countries. In the research conducted by the Turkish Statistical Institute [TUİK] (2021), it was revealed that 93% of internet users in Türkiye used social media to message, 84.9% made voice or video calls, 61.4% created profiles, sent messages, or shared content, and 56.5% used internet banking services between April 2021 and June 2021. According to this research, when internet usage intervals and rates in Türkiye are examined, it is clear that the majority of users generate digital data and interact with digital products using personal information. These results indicate that digitalization has a crucial place in daily life in Türkiye.

Digital technologies provide various advantages in daily life, but they have also caused serious social issues. Worries about digital data security are one of these issues. With digitalization emerging in almost every field, cyber-attacks aiming at the personal digital data of individuals and institutions have increased the risk of failure to protect digital data security (Demir, 2019). According to Eminağaoğlu and Gökşen's (2009) research, Turkey had the second highest number of virus-type code attacks worldwide in 2008. It was also revealed that %65 of DSL connections have no firewalls and information could be easily hacked from %43 of web servers. As a result of this, numerous critical sectors such as education, tourism, textile and public utilities are at risk in terms of digital data security. Considering the extent of the digital transformation taking place in Türkiye, this situation is quite thought-provoking. In addition, personal digital data that was seized or attempted to be seized by hackers as a result of cyber attacks on popular online shopping or social networking platforms has intensified people's concerns about digital data security.

Due to the increase in activities using digital data, many governments developed a variety of strategies to raise awareness of digital data security, especially with the COVID-19 pandemic. For instance, the US Cyber and Infrastructure Security Agency has established a separate section about digital data security on its official website. The European Commission and Europol announced that they will work together to address threats to digital data security caused by COVID-19. The OECD published an article on digital security and aimed to raise awareness by providing recommendations to governments and society for the appropriate protection of digital data (OECD, 2020).

There are several methods that help allaying the worries of individuals about digital data security. One of the most effective ways is to increase awareness as well as comprehension of data security. For this reason, it is very important for users to receive awareness training (Eminağaoğlu & Gökşen, 2009). In our country, social studies is among the courses that aim to raise awareness about digital data security in secondary schools run by the Ministry of National Education. There are explanations about how to use digital data and technologies under the "Social Studies and Technology" learning theme of the Social Studies Course Curriculum. Additionally, the SBDÖP includes literacies like "information literacy," "digital literacy," and "data literacy" (MoNE, 2024).

Considering this information, it is possible to conclude that one of the social studies course's main goals is to raise middle school students' understanding of digital data protection. With the development of information and communication technologies, citizenship competencies required in digital environments could be gained through social studies courses. Thus, it is possible to prepare the future generation of digital citizens and provide an effective social studies course (Karaduman and Öztürk, 2014). In this sense, it is expected that social studies teachers who address and attempt to teach their students about digital data security issues should be exceptionally knowledgeable about these topics. As a result, it is quite crucial for social studies teachers to learn and have awareness about digital data security during pre-service training. Hence, investigating the levels of awareness of digital data security of social studies teacher candidates is crucial for interpreting and evaluating the existing situation.

As a result of the literature review, it was observed that there are several research conducted on awareness of teachers, administrative staff, high school students and university students regarding digital data security (Avcı & Arslan, 2019; Bıkmaz, 2017; Çam, Aslay & Özen, 2019; Dönmez, 2019; Eroğlu, 2018; Göldağ, 2021; Gkioulos, Wangen, Katsikas, Kavallieratos ve Kotzanikolau, 2017; Hassan vd., 2022; Karacı, Akyüz & Bilgici, 2017; Korkmaz, 2018; Sapanca ve Kanbul, 2022; Törley, 2020; Yerby ve Floyd, 2018; Yılmaz, Şahin & Akbulut, 2016). When the studies on university students were examined, it was revealed that they are conducted with university students from various faculties, as well as students studying health management, information and document management, computer engineering, and computer and educational technologies departments. However, it was observed that there was no research on the awareness of social studies teacher candidates regarding digital data security. Considering the significance of digital data security awareness for the social studies course and social studies teacher candidates, as well as the current state of the literature, it is believed that this study, which will determine the digital data security awareness of social studies teacher candidates and examine their awareness levels in terms of various variables, is very important. Hence, the main purpose of this research is to examine the digital data security awareness levels of social studies teacher candidates in terms of various variables. Based on the main purpose of the research, the following questions were sought:

- What is the level of digital data security awareness of social studies teacher candidates?
- Is there a significant difference in digital data security awareness of social studies teacher candidates in terms of gender?
- Is there a significant difference in digital data security awareness of social studies teacher candidates in terms of grade?
- Is there a significant difference in digital data security awareness of social studies teacher candidates in terms of average daily computer usage time?
- Is there a significant difference in digital data security awareness of social studies teacher candidates in terms of avarege daily social media usage time?

2 Method

In this section, information about the research model, population and sample, data collection instruments and data collection and analysis is presented.

2.1 Research Design

The survey method which is one of the quantitative research methods was employed in order to investigate digital data security awareness of social studies teacher candidates in terms of various variables in this study. Survey research focuses on the general tendencies of the population

regarding the subject under consideration (Creswell, 2012). Since this research focuses on the general tendencies of social studies teacher candidates studying at state universities in Turkey regarding digital data security awareness, the survey model was employed in the research.

2.2 Population and sample

This study's population consists of social studies teacher candidates enrolled at Turkish state universities. Convenient sampling strategy was adopted to determine the sample of the study. The convenience sampling strategy, which is widely used in many fields, is a strategy that prioritizes reaching potential participants. In this strategy, researchers include the most accessible participants who meet their criteria in their samples (Baker et al., 2013). During the period when the research data were collected, due to the two massive and destructive earthquakes centered in Kahramanmaraş, all undergraduate programs in the country shifted to distance education. Therefore a convenient sampling approach was used, and the data were collected online. In this respect, the study's sample consisted of 384 social studies teacher candidates enrolled in social studies undergraduate programs at 15 different Turkish universities. The information about the sample of the study is presented in Table 1.

Table 1 Information about sample of the study

Gender	Grades	N
Female	1. Grade	104
	2. Grade	87
	3. Grade	71
	4. Grade	44
Male	1. Grade	26
	2. Grade	22
	3. Grade	13
	4. Grade	17
Total		384

Table 1 shows that the study's sample includes 384 social studies teacher candidates, 306 of whom are female and 78 of whom are male. When the total number of female and male teacher candidates participating in the study is compared with the relevant data in the CoHE ATLAS database, which contains data on all undergraduate programs by the Council of Higher Education (CoHE), the ratio of female and male teacher candidates participating in the study is similar to the ratio of female and male teacher candidates studying in the social studies teaching undergraduate program nationwide. (CoHE ATLAS, 2024). In other words, the study's sample has a similar male-female ratio to the study's universe. Furthermore, 104 of the female participants are enrolled in the first grade, 87 in the second grade, 71 in the third grade and 44 in the fourth grade, while 26 of the male participants are enrolled in the first grade, 22 in the second grade, 13 in the third grade and 17 in the fourth grade.

2.3 Data collection instrument

The “Digital Data Security Awareness Scale” developed by Yılmaz (2015) was used as the data collection instrument in the study. The scale consists of a single dimension and 32 items in total, and was developed as a 5-point Likert-type scale consisting of “strongly disagree”, “disagree”, “undecided”, “agree” and “strongly agree”. In addition, the Cronbach’s Alpha internal consistency coefficient of the scale was found to be .945, and it was calculated as .930 for this study. Since the data collection instrument was scaled as a 5-point Likert-type scale, a total of 4 levels were determined as the arithmetic mean: very low for 1-2.00, low for 2.01-3.00, high for 3.01-4.00 and very high for 4.01-5.00.

Before collecting data to answer the research questions, Confirmatory Factor Analysis (CFA) was performed to determine the validity of the data collection tool for teacher candidates. CFA is usually performed to determine whether an already established structure is also valid for sample with different characteristics (Huck, 2012). Since the data collection tool used in this research was previously developed for teachers and there is no scientific information on whether the structure is also valid for teacher candidates, CFA was performed with the data obtained from the teacher candidates. In this regard, data was collected from a total of 245 teacher candidates studying in the Science Teaching, Primary Mathematics Teaching, Classroom Teaching, Turkish Language Teaching, Guidance and Psychological Counseling Undergraduate Programs of a state university, and CFA was performed with the obtained data. The CFA results are shown in Table 2.

Tablo 1 Confirmatory Factor Analysis results

Fit Indices	Criteria		Obtained Value
	Good Fit	Acceptable Fit	
x^2/df	$0 \leq x^2/df \leq 2$	$0 \leq x^2/df \leq 5$	1,626
RMSEA	.00≤ RMSEA≤.05	.00≤ RMSEA≤.08	,050
SRMR	.00≤ SRMR≤.05	.00≤ SRMR≤.08	,058
CFI	.95≤ CFI≤.10	.90≤ CFI≤.95	,901

According to Kline (2015), the most essential fit indices for CFA are x^2/df, RMSEA, SRMR, and CFI. Table 2 shows that the x^2/df and CFI fit indices were calculated as good, and the RMSEA and SRMR fit indices were calculated as acceptable (Bryne, 1994; Hu and Bentler, 1999; Tabachnick and Fidel, 2001). Based on the data obtained, it was found that the structure of the scale developed for teachers was also valid for teacher candidates. In other words, it concluded that the data collection instrument was appropriate for teacher candidates.

2.4 Data collection and analysis

Before starting to collect data within the scope of the research, permission for the use of the scale was first obtained from the researchers who developed the data collection tool. After receiving permission, ethics committee approval was obtained from the ethics committee of a state university in Turkey (09.08.2022-83898).

After completing the relevant permissions processes, data were collected face-to-face from prospective teachers enrolled in undergraduate programs other than social studies teaching at a public institution for the CFA, and the results were analyzed using the JAMOVI software.

After verifying the construct validity of the data collection instrument, data were collected via Google Forms from 388 social studies teacher candidates at 15 different state universities in Turkey. The data obtained via Google Forms were first converted to EXCEL format and then transferred to the JAMOVI software for analysis.

In order to determine the most appropriate analysis to answer the research questions, some parameters related to the data set were examined. Initially, some descriptive statistical information about the data set was considered. As a result of the examination, it was determined that the data belonging to 4 participants were extreme values and were removed from the data set. After the extreme values were removed, it was observed that the skewness and kurtosis values related to the data were within ± 2, and considering these values. These values indicated that the data set did not deviate significantly from the normal distribution (George and Mallery, 2019). In addition, the Kolmogorov-Smirnov test findings, as well as histogram and density graphs, were

analyzed (Huck 2012). Levene Homogeneity Test was applied for the homogeneity of variances (Gastwirth, Gel and Miao, 2009). As a result of all the examinations carried out, it was decided to use parametric tests to answer the research questions. Based on the information about the obtained data, descriptive statistics were used to determine the digital data security awareness levels of social studies teacher candidates; t-test for independent samples was performed to investigate the significant difference according to the gender variable; and one-way analysis of variance (ANOVA) was performed to investigate the significant differences of grade levels, daily internet usage time and daily social media usage time. Tukey test, one of the post-hoc tests, was used to determine the significant differentiation between the groups in which the one-way ANOVA result was found to be significant (Büyüköztürk, Çokluk, & Köklü, 2020).

3 Findings

In this section, firstly, the results regarding the digital data security awareness levels of social studies teacher candidates are presented, and then, the findings regarding the examination of the digital data security awareness levels of social studies teacher candidates according to gender, grade level, daily average computer usage time and daily average social media usage time variables are presented.

3.1 Digital data security awareness levels of social studies teacher candidates

Descriptive statistics were employed to assess the digital data security awareness of social studies teacher candidates. Table 3 shows descriptive statistics on the levels of digital data security awareness of social studies teacher candidates.

Table 2 Descriptive statistics of social studies teacher candidates

N	$\bar{X}$	se	%95 Confidenvce Interval		Mod	sd	Range	Minimum	Maximum
			Lower	Upper					
384	4,02	,03	3,97	4,07	3,94	,52	2,63	2,38	5,00

Table 3 demonstrates that the total arithmetic mean of data security awareness of social studies teacher candidates is 4.02. This finding demonstrates that social studies teacher candidates have a "very high" degree of digital data security awareness. Furthermore, it was found that the median value, or most frequently repeated value, is 3.94. It was also discovered that the arithmetic mean of the participants with the lowest level of digital data security awareness was 2.83, while the maximum level was 5.00.

3.2 Investigation the digital data security awareness of social studies teacher candidates according to gender variable

The study tried to answer the research question of whether social studies teacher applicants' digital data security awareness differs according to gender. Table 4 shows descriptive statistics for the data obtained in this direction.

Table 3 Descriptive statistics

Group	N	$\bar{X}$	Median	sd	se
Female	306	127,60	128,00	16,26	,93
Male	78	132,91	131,00	17,17	1,94

Table 4 indicates that the average total score for 306 female social studies teacher candidates is 127.60, and the average score for 78 male social studies teacher candidates is 132.91. In addition, the median value for female teacher candidates was found as 128.00, and the median value for

male teacher candidates was found as 131.00.

In order to investigate the digital data security awareness of social studies teacher candidates according to the gender variable, an independent samples t-test was performed. Before proceeding to the analysis, it was checked whether the data set met the relevant assumptions. For this, the skewness and kurtosis values of the data, the Kolmogorov-Smirnov test results and the Levene Homogeneity Test results were examined. The results are presented in Table 5.

Table 4 Kurtosis and Skewness Values, Results of Kolmogorov-Smirnov and Levene Homogenity Tests

Kurtosis		Skewness		Kolmogorov-Smirnov		Levene's Homogenity Test			
Male	Female	Male	Female	Statistic	*p*	F	df1	df2	p
-,38	-,32	,16	,01	,04	,642	,63	1	382	,430

Table 5 demonstrates skewness and kurtosis values between ±2. Furthermore, it was found that the Kolmogorv-Smirnov Normality Test and the Levene Homogeneity Test results were insignificant. Moreover, the histogram and density graphs of the data were examined as well. Based on these findings, it can be concluded that the data did not depart substantially from the normal distribution and were distributed homogeneously. In other words, the data obtained meet the assumptions for the t test. After confirming that the assumptions were met, the t test for independent samples was performed. Table 6 shows the results of t-test for independent samples.

Tablo 5 Results of t-test for independent samples

Statistic	sd	*p*	$\bar{X}$ difference	se difference
-2,54	382,00	,006	-5,31	2,09

Note: H_a μ Female < μ Male

As shown in Table 6, it was found that the digital data security awareness levels of female and male social studies teacher candidates differ significantly and this significant difference is in favor of male teacher candidates.

3.3 Invastigating the digital data security awareness of prospective social studies teachers according to the grade variable

The study sought to answer the research question of whether social studies teacher candidates' digital data security awareness changed by grade level. Table 7 shows descriptive statistics for the data obtained in scope of this.

Table 6 Descriptive statistics

Group	N	$\bar{X}$	Median	sd	se
1st grades	130	130,08	129,00	14,77	1,30
2nd grades	109	127,39	126,00	17,24	1,65
3rd grades	84	128,10	129,00	17,46	1,90
4th grades	61	128,82	128,00	17,83	2,28

Table 7 shows that the average total score of 130 first-year teacher candidates was scored 130.08; 109 second-year teacher candidates scored 127.39; 84 third-year teacher candidates scored 128.10; and 61 fourth-year teacher candidates scored 128.82. Additionally, the median results for teacher candidates were 129.00, 126.00, 129.00, and 128.00, respectively.

One-way ANOVA was performed to analyze the digital data security awareness of social studies teacher candidates by grade level. The data set was initially examined to check if data set satisfied the necessary assumptions. The assumptions were based on data skewness and kurtosis values,

as well as Kolmogorov-Smirnov and Levene homogeneity test findings were examined. The results are presented in Table 8.

Tablo 7 Skewness and kurtosis values and results of Kolmogorov-Smirnov and Levene Homogenity Tests

Skewness				Kurtosis				Kolmogorov-Smirnov		Levene's Homogenity Test			
1st grades	2nd grades	3rd grades	4th grades	1st grades	2nd grades	3rd grades	4th grades	Statistics	*p*	F	df1	df2	*p*
-,19	-,04	-,64	-,35	,08	-,37	,22	,18	,04	,563	,155	3	380	,155

Table 8 demonstrates skewness and kurtosis values between ±2. Furthermore, it was found that the Kolmogorv-Smirnov Normality Test and the Levene Homogeneity Test results were insignificant. Moreover, the histogram and density graphs of the data were examined as well. Based on these findings, it can be concluded that the data did not differ substantially from the normal distribution and were distributed homogeneously. In other words, the data obtained meet the assumptions for the one-way ANOVA. After confirming that the assumptions were met, one-way ANOVA was performed. The results of one-way ANOVA are presented in Table 9.

Table 8 One-way ANOVA results

F	df1	df2	*p*
,56	3	380	,641

When the one-way ANOVA findings in Table 9 are analyzed, it can be seen that social studies teacher candidates digital security awareness levels do not differ significantly by grade level. In other words, there was no significant difference in the data security awareness levels of social studies teacher candidates according to the grade level variable.

3.4 Examining the digital data security awareness of social studies teacher candidates according to the average daily computer usage time variable

The study sought to determine whether social studies teacher candidates' digital data security awareness differed according to their average daily computer usage time. Table 10 shows descriptive statistics for the data obtained in this direction.

Table 9 Descriptive statistics

Group	N	$\bar{X}$	Median	Sd	se
< 1 hour	146	125,25	126,00	17,27	1,43
1-3 hours	150	130,45	129,50	15,83	1,29
4-6 hours	72	131,33	131,50	16,26	1,92
≥ 7 hours	16	131,50	129,50	13,85	3,46

It was shown in Table 10 that the average total score of the teacher candidates who use computers for less than 1 hour per day is 125.25; 130.45 for those who use computers for 1-3 hours on average; 131.33 for those who use computers for 4-6 hours on average and 131.50 for those who use computers for 7 hours or more. In addition, it is was found that the median values obtained from the teacher candidates are 126.00; 129.50; 131.50 and 129.50, respectively.

One-way ANOVA was performed to investigate the digital data security awareness of social studies teacher candidates according to their average daily computer usage time. The data set was initially examined to determine if it satisfied the required assumptions. For the assumptions, the skewness and kurtosis values of the data, the Kolmogorov-Smirnov test results and the Levene Homogeneity Test results were examined. The results are presented in Table 11.

Table 10 Skewness and kurtosis values and the results of Kolmogorov-Smirnov and Levene Homogenity Tests

Skewness				Kurtosis				Kolmogorov-Smirnov		Levene's Homogenity Test			
< 1 hour	1-3 hours	4-6 hours	≥ 7 hours	< 1 hour	1-3 hours	4-6 hours	≥ 7 hours	Statistic	*p*	F	sd1	sd2	*p*
-,30	-,22	-,42	,57	,04	-,05	-,12	-,53	,04	,596	,40	3	380	,752

Table 11 demonstrates skewness and kurtosis values between ±2. Furthermore, the results of the Kolmogorv-Smirnov Normality Test and Levene Homogeneity Test were found to be non-significant. In addition, the histogram and density graphs of the data were examined. Based on these findings, it can be concluded that the data did not differ substantially from the normal distribution and were distributed homogeneously. In other words, the data obtained meet the assumptions for the one-way ANOVA. After confirming that the assumptions were met, one-way ANOVA was performed. The results of one-way ANOVA are presented in Table 12.

Tablo 11 One-way ANOVA results

F	df1	df2	*p*
3,50	3	380	,016

Table 12 indicates that the obtained data differ significantly according to the average daily computer usage time variable. In order to determine which groups differ significantly, the Tukey test, a post-hoc test, was employed. The Tukey test results are shown in Table 13.

Table 12 Tukey test results

Groups		< 1 hour	1-3 hours	4-6 hours	≥ 7 hours
< 1 hour	$\bar{X}$ difference	-	-5,21	-6,09	-6,25
	p	-	,033	,050	,470
1-3 hours	$\bar{X}$ difference		-	-,88	-1,05
	p		-	,982	,995
4-6 hours	$\bar{X}$ difference			-	-,17
	P			-	1,00
≥ 7 hours	$\bar{X}$ difference				-
	p				-

As shown in Table 13, significant difference was found between the social studies teacher candidates who use computers for less than 1 hour per day on average and the social studies teacher candidates who use computers for 1 to 3 hours per day on average and 4 to 6 hours per day on average, not in favor of those who use computers for less than 1 hour per day. In other words, it was discovered that social studies teacher candidates' digital data security awareness differed significantly from those who used computers for an average of 1 to 3 hours and 4 to 6 hours each day.

3.5 Examining the digital data security awareness of social studies teacher candidates according to the daily average social media usage

The study sought to determine whether social studies teacher candidates' digital data security awareness differed according to their daily avarage social media usage time. Table 14 shows descriptive statistics for the data obtained in this direction.

Table 13 Descriptive statistics

Group	N	$\bar{X}$	Median	sd	se
< 1 hour	44	134,56	134,00	13,44	2,05
1-3 hours	179	127,61	127,00	15,63	1,17
4-6 hours	116	128,95	128,00	17,08	1,59
≥ 7 hours	45	127,56	128,00	19,62	2,92

Table 14 shows that the average total score of teacher candidates who use social media for less than an hour per day is 134.56; 127.61 for those who use social media for 1-3 hours on average; 128.95 for those who use social media for 4-6 hours on average; and 127.56 for those who use social media for 7 hours or more. Besides, it is shown that the median values obtained from teacher candidates are 134.00; 127.00; 128.00 and 128.00, respectively.

One-way ANOVA was performed to investigate the digital data security awareness of social studies teacher candidates according to their average daily social media usage time. The data set was initially examined to determine if it satisfied the required assumptions. For the assumptions, the skewness and kurtosis values of the data, the Kolmogorov-Smirnov test results and the Levene Homogeneity Test results were examined. The results are shown in Table 15.

Tablo 14 Skewness and Kurtosis values and the results of Kolmogorov-Smirnov and Levene Homogenity Tests

Skewness				Kurtosis				Kolmogorov-Smirnov Test		Levene's Homogenity Test			
< 1 hour	1-3 hours	4-6 hours	≥ 7 hours	< 1 hour	1-3 hours	4-6 hours	≥ 7 hours	Statistics	*p*	F	df1	df2	p
-,50	-,02	-,60	-,10	1,27	-,51	,67	-,39	,03	,807	1,90	3	380	,128

Table 15 demonstrates skewness and kurtosis values between ±2. Furthermore, the results of the Kolmogorv-Smirnov Normality Test and Levene Homogeneity Test were found to be non-significant. In addition, the histogram and density graphs of the data were examined. Based on these findings, it can be concluded that the data did not differ substantially from the normal distribution and were distributed homogeneously. In other words, the data obtained meet the assumptions for the one-way ANOVA. After confirming that the assumptions were met, one-way ANOVA was performed. The results of one-way ANOVA are presented in Table 16.

Table 15 One-way ANOVA results

F	df1	df2	*p*
2,18	3	380	,090

Table 16 reveals that the data obtained do not differ significantly according to the average daily social media usage time variable. In other words, there was no significant difference in the data security awareness levels of social studies teacher candidates according to the average daily social media usage time variable.

4 Results, Discussion and Recommendations

The study investigated the digital data security awareness levels of social studies teacher candidates in terms of several variables. The study, which employed a survey model from quantitative research methods, first determined the digital data security awareness levels of social studies teacher candidates, and then examined the digital data security awareness levels according to gender, grade level, daily average computer usage time, and daily average social media usage time.

As a result of the analysis of data, it was concluded that the digital data security awareness of

social studies teacher candidates was at a "very high" level. Similarly, in the studies conducted by Göldağ (2021), Hassan et al. (2022), Hızmalı and Tosun (2022) and Törley (2020), it was determined that the digital data security awareness levels of university students were high. Furthermore, Özerbaş, Mayrambek Kızı, and Safi's (2023) research found that university students in Kyrgyzstan had a high level of digital data security awareness. Öztürk and Çakır's (2022) research found that instructors, like university students, have high levels of digital data awareness. Besides, the studies conducted by Aksoğan and Atıcı (2023) and Yerby and Floyd (2018) revealed that academics' digital data security levels are similarly high. On the other hand, the study conducted by Tarhan (2022) concluded that pharmacy students' digital data security awareness is at a moderate level. Considering all of this information, it could be assumed that the results of the study are supported by relevant studies in the literature. However, users' awareness of digital data security does not imply that they act in this direction. According to Taha and Dahabiyeh's (2020) research, university students have a high level of awareness of the fundamental concepts of digital information security, but this awareness is not reflected in their behavior when using computers and smartphones. The fundamental explanation for this, as well as other research findings that reached similar conclusions in the literature, is that today's university students are members of Generation Z, which is called digital natives. Individuals in Generation Z, who are digital natives, were born and raised in a technological environment, thus they are constantly exposed to and produce digital data. Since individuals spend so much time in digital setting, having a high level of awareness of digital data security is reasonable. However, a high level of awareness of digital data security is not an indication that they act in this sense. In other words, while social studies teacher candidates may be well-versed in digital data security, this awareness may not be reflected in their daily life.

One of the results of the study is that male social studies teacher candidates have significantly higher levels of digital data security awareness than female social studies teacher candidates. Farooq et al. (2015), Göldağ (2021), and Hızmalı and Tosun (2022) discovered that male university students had higher levels of digital information security information and behavior compared to female university students. According to the findings of Sapanca and Kanbul (2015), female instructors reflect lower levels of digital information security awareness than male teachers. Öztürk and Çakır's (2022) study found that digital data security awareness levels of classroom teachers and Özerbaş, Mayrambek Kızı, and Safi's (2023) study of Kyrgyz university students were not significantly different by gender. These findings could point to that awareness of digital data security varies by country or culture, as well as by gender. Al-Shehri and Clarke (2009), Gkioulos et al. (2017), Rezgui and Marks (2008), and Wiley, McCormac, and Calic (2020) have found that culture can influence digital information and data security awareness.

The research revealed that the levels of digital data security information of social studies teacher candidates did not differ significantly by grade level. Research by Farooq et al. (2015) and Göldağ (2021) also found no difference in digital data security awareness of university students by grade level. However, Hızmalı and Tosun's (2022) study found a significant difference. Research by Aksoğan and Atıcı (2023) and Öztürk and Çakır (2022) also indicates that digital data security awareness differs by age and working year. Considering all of this evidence, it is possible to conclude that the reason why the digital data security awareness levels of social studies teacher candidates don't differ significantly by class level is related to the field. Because one of the main purposes of the social studies course is to introduce students to the digital world and develop digital literacy skills, and because topics related to the digital world are addressed in many

undergraduate courses, the lack of a significant difference in class level can be interpreted as a probable result.

In addition, it was concluded that the digital data security awareness of social studies teacher candidates showed a significant difference according to the average daily computer usage time. According to the findings, social studies teacher candidates with more average daily computer usage time had higher levels of digital data security awareness than those with less average daily computer usage. The study's findings are consistent with previous research on several sample groups (Aksoğan and Atıcı, 2023; Göldağ, 2021; Hızmalı and Tosun, 2022; Öztürk and Çakır, 2022). Considering the findings of this study and others in the literature, it is reasonable to foresee that social studies teacher candidates who interact more with computers have much higher digital data security awareness. It is reasonable to think that social studies candidates who spend more time with computers will be more aware of the numerous benefits that computers give, as well as the threats they may face. According to Göldağ's (2021) research, increased computer engagement among social studies teacher candidates can boost digital literacy and raise awareness of digital data security.

Finally, the study investigated whether the digital data security awareness of social studies teacher candidates differed significantly according to their average daily social media usage time, and no significant difference was found as a result of the analysis of the obtained data. In the study conducted by Göldağ (2021), it was concluded that the digital data security awareness levels of university students did not differ significantly according to the average daily social media usage time variable. Similarly, Kara's (2021) study revealed that the digital literacy levels of university students, which is a crucial component of digital data security, did not differ according to computer usage time. Considering all of this information, one of the primary reasons why the digital data security awareness levels of social studies teacher candidates did not differ significantly according to the daily social media usage time variable could be that the purpose of using social media is very different from acquiring knowledge or skills related to a situation.

Based on the study's findings, the following may be suggested:

- Various trainings can be provided to increase the awareness of female social studies teacher candidates regarding digital data security.
- Opportunities should be created for social studies teacher candidates to interact more with computers in their pre-service training.
- Research can be carried out to investigate the digital data security practices and experiences of social studies teacher candidates.
- Studies can be conducted on variables that can predict the digital data security awareness of social studies teacher candidates.

5 Statement of Researchers

5.1 Researchers contribution rate statement

The authorship contribution for this paper is as follows: the first author contributed 40%, the second author contributed 60%.

5.2 Conflict statement

The authors declare no conflict of interest.

5.3 Support and thanks

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