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The Illusions on Digital Citizenship: What We Know and What We Do?

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Abstract:
Introduction: The purpose of this paper is to examine the relationship between the digital citizenship levels of information and communication technology teacher candidates and their user behaviours and habits in the digital world. The experimental work presented here provides one of the first investigations into a deeper understanding of misconceptions, problems, and deficiencies in digital citizenship and its sub-dimensions. Also, the study offers some important insights to bring solutions to the problems encountered in teaching the concept to individuals.
Methods: To reach the goal, a mixed-method approach was utilized. Participants of the study were 74 information and communication technology teacher candidates enrolling at a public university in Turkey. Data for this research were collected using Digital Citizenship Scale (Kocadağ, 2012) and the e-Citizen mobile application. A combination of quantitative and qualitative approaches was used in the data analysis.
Results: According to the research findings, it was established that the participants did not have sufficient awareness of the concept of digital citizenship in the sub-dimensions of digital security, digital health, digital rights and responsibilities, digital law, digital etiquette, and digital commerce. The digital citizenship levels of the participants in these dimensions obtained from the scale were not consistent with their digital technology user behaviours and habits. Considering digital access, digital communication, and digital literacy sub-dimensions, it was concluded that pre-service teachers had sufficient knowledge. Another research finding shows that the responses of the participants to the scales should be questioned and emphasizes the importance of using different data collection methods.
Discussion: It was specified that the average digital citizenship score of 74 information and communication technology teacher candidates participated in the study was found to be 262 and it was described as

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"Very Good." These results corroborate with the findings of a great deal of the previous works that show that digital citizenship levels of individuals have increased in recent years. However, data obtained from user habits and behaviours did not support this situation. This inconsistency may be due to the participants not acting objectively during scale scoring. The reason for this is not clear, but we thought possible causes maybe that teacher candidates may not express their real thoughts, may not want to get low scores on Digital Citizenship Scale (DCs) or they may see themselves as adequate despite their deficiencies. This situation is one of the biggest limitations of self-report measures and it is named "Social Desirability Bias" in the literature. There are, however, other possible explanations. In the study, participants have filled the DCs first and then used the e-Citizen application. Information and communication technology teacher candidates have taken lower scores from User Habits and Behaviours Surveys (UHBs) in each of the sub-dimensions compared to DCs. According to these data, we can infer that the participants may be able to increase their knowledge about digital citizenship and see their deficiencies thanks to the e-Citizen mobile application.

Limitations: It should not be forgotten that this study was limited by the validity and reliability of the digital citizenship scale, the efficiency of the mobile application, and the level of knowledge of the participant group and their objectivity in their answers.

Conclusion: Overall, this study strengthens the idea that there are problems in the concept of digital citizenship and its sub-dimension. As a result of the research, although the digital citizenship levels of the participants were measured to be very good, it was determined that there are inconsistencies with their behaviours and habits during the use of digital technologies in six of the nine sub-dimensions (security, health, rights and responsibilities, law, etiquette, and commerce). In three sub-dimensions: digital communication, access, and literacy, the data were relatively consistent. At the end of the study, the possible causes of the digital citizenship misconception experienced by teacher candidates were discussed separately and suggestions were made for future studies.

Key words: digital citizenship, e-Citizen, mobile application.

Introduction

Today's world is experiencing one of the fastest periods of progress and change in the history of civilization. The technology that causes this progress affects people in very different dimensions and pushes them to different habits of life (Görmez, 2016; Karaduman & Öztürk, 2014; Sakallı & Çiftçi, 2016). After digital technologies and the internet have started to play a significant role in people's daily lives, many people have been able to do most of their daily work in the virtual world, such as shopping, banking transactions, and tax payments

(Kaya & Kaya, 2014; Özer, 2016). Individuals can carry out their daily work through the digital world and interact with many different people, from inside or outside their own culture, using various communication tools, games, and virtual environments (Çubukcu & Bayzan, 2013; Engin & Sarsar, 2015). People can be parts of a global society by the help of technological possibilities (Engin & Sarsar, 2015). Nevertheless, this situation adds a different dimension to individuals' existing citizenship responsibilities (Elçi & Sarı, 2016; Görmez, 2016).

Each individual is regarded as an independent citizen in the digital world by public and private institutions, and these institutions impose many different obligations on people. These obligations that we encounter under the concept of digital citizenship are handled by researchers with minor differences but are generally defined as exhibiting behaviours that provide legal, ethical, safe, and responsible use of information and communication technologies in online environments (Görmez, 2016; Mossberger, Tolbert, & McNeal, 2007; Ribble & Bailey, 2007; Vizenor, 2014). Payne (2016) maintains that the implementation of legal and ethical behaviours in technology-related fields is the basis of digital citizenship. In a study conducted by Kabataş (2019), the basic principles of digital citizenship are expressed as (1) being respectful to themselves, others and intellectual rights, (2) protecting themselves, others and intellectual rights, and (3) educating themselves and others.

The construct of digital citizenship was first articulated by Marc Pensky in 2001, but over the past two decades, no consensus has been reached on the definition of the concept (Yalçınkaya & Cibaroğlu, 2019). Correlatively, in previous studies on digital citizenship, researchers have revealed very different results. Even in the same period of research, it has been observed that the knowledge of the participants about digital citizenship is at very different levels. It is obvious that the situation is not very different in terms of the sub-dimensions of digital citizenship. At a time when digital technologies are used in all areas of life, individuals need to be informed about the concept of digital citizenship, have sufficient awareness, and fulfill their responsibilities. Herein, first of all, it is necessary to reveal what problems are experienced in the field of digital citizenship in order to develop solutions. The experimental work presented here provides one of the first investigations into a deeper understanding of misconceptions, problems, and deficiencies in digital citizenship and its sub-dimensions. Also, the study offers some important insights to bring solutions to the problems encountered in teaching the concept to individuals.

1 Theoretical background

1.1 Digital citizenship and its sub-dimensions

Digital citizenship is defined by Ribble and Bailey (2006) as behavioural norms for the use of technology. Mossberger et al. (2007), on the other hand, explained digital citizenship as the ability of individuals to join society online. Recent studies mostly defined digital citizens as people who can use the internet regularly and who know their rights and responsibilities on the internet (Choi, 2016; Thomas, 2018). The definition of digital citizenship has changed over time. Previous research has established that the definition of the concept focused on the use of digital technologies in the early stages. But then, many recent studies have shown that the focus has been on the responsibilities that arise during the use of digital technologies. At this point, the importance of dimensions related to the digital citizenship concept has been understood because digital citizenship had a structure that could be handled from many different perspectives.

To better understand the concept of digital citizenship, Ribble and Bailey (2007) examined this subject in nine sub-dimensions. The definitions made by Mike S. Ribble and Gerald D. Bailey are generally accepted by the researchers and it has been stated in the literature that these nine sub-dimensions are the basis of the concept of digital citizenship (Elçi & Sarı, 2016; Gazi, 2016; Görmez, 2016; Kaya & Kaya, 2014; Vizenor, 2014). Ribble and Bailey (2007) labeled these sub-dimensions as (1) digital access, (2) digital commerce, (3) digital communication, (4) digital literacy, (5) digital etiquette, (6) digital law, (7) digital rights and responsibilities, (8) digital health, and (9) digital security.

In one well-known recent experiment, Buente (2011) associated digital citizenship with daily internet use and socio-demographic factors. In another study investigating digital citizenship sub-dimensions, Choi (2016) reported the four sub-dimensions as (1) ethics, (2) media and information literacy, (3) critical resistance, and (4) participation/engagement. Although there are different definitions in the literature, it is seen that the definitions made by Ribble and Bailey (2007) are taken as a basis in the research conducted on the sub-dimensions of digital citizenship.

1.2 Digital citizenship in education

In a situation where digital citizenship has become increasingly important for individuals in today's world, it has inevitably been considered in terms of education. Teaching the concept of digital citizenship correctly is the basis of training responsible digital individuals. The academic literature on digital citizenship has shown that researchers approach this concept in terms of both student's and teachers' perspectives. At this point, several researches have begun to determine the current level of knowledge of individuals about the concept of digital citizenship. To determine the digital citizenship level of individuals, various scales were developed by many researchers such as Karaduman (2011),

Kocadağ (2012), Oyademi (2012), Isman and Gungoren (2013), Elçi (2015), Öztürk (2015), and Choi, Glassman, and Cristol (2017). For instance, Oyademi (2012) developed a five-dimensional scale in the study of university students focusing on internet usage habits. In another research focusing on secondary school students, the scale developed by Öztürk (2015) has a single factor structure. Choi et al. (2017) developed a scale with 26 items and a five-dimensional structure in their studies with undergraduate and graduate students. In addition to these scales mentioned during the data collection phase, the researchers who conducted studies on digital citizenship also benefited from qualitative interview forms and questionnaires.

Numerous studies have attempted to explain how digital citizenship is perceived by students, teacher candidates, and teachers. In the research conducted by Karaduman and Öztürk (2014), sixth-grade students were made to take part in activities related to digital citizenship and its sub-dimensions for thirteen weeks. As a result of the study, it was stated that students' awareness about digital citizenship increased but a permanent result could not be obtained. In the same year, Çepni, Oğuz, and Kılcan (2014) observed that the opinions of primary school students about digital citizenship attitudes changed according to gender, the monthly income level of the family, internet connection at home, and frequency of access to the internet. Öztürk (2015), analyzed the data from sixth, seventh, and eighth-grade students and concluded that students commonly use digital technologies but do not have sufficient information about their rights and responsibilities in the digital world.

In the first of the studies in which teacher candidates or teachers constituted the research group, Kocadağ (2012) measured 0.36% of the participants had a very low level of digital citizenship and 33.32% were very good. In the research carried out by Kaya and Kaya (2014), also, teacher candidates have determined as the participant group. The researchers found that the vast majority of teacher candidates addressed the concept of “digital” and “citizenship” separately when defining digital citizenship and had difficulty in establishing the relationship between the two terms. In another article, Engin and Sarsar (2015) reported that the teacher candidates' knowledge and skill levels required by digital citizenship are not high enough. Unlike the previous research results, Sakallı and Çiftçi (2016) concluded that the digital citizenship levels of the teacher candidates were high. Similarly, Gazi (2016) showed that the awareness of the participants regarding digital citizenship and digital citizenship knowledge improved. On the other hand, in another study conducted in the same period as these researches, it was found that most of the teacher candidates had not heard about the concept of digital citizenship, despite using the internet for an average of four and a half hours a day (Özer, 2016). In a similar vein, Görmez (2016) measured that the participants did not have a satisfactory level of knowledge about the concept of digital citizenship. In the recent study carried out by Kabataş (2019), it was determined that teacher candidates’ digital citizenship levels are very good.

Of late years, researchers attempted to evaluate the impact of the sub-dimensions of digital citizenship to individuals. In 2018, Choi, Cristol, and Gimbert (2018) reported that teachers only had a high level of knowledge in digital communication and digital literacy sub-dimensions. As a result of the study conducted by Vural and Kurt (2018), it was concluded that the teacher candidates were good in some sub-dimensions of digital citizenship, and in other dimensions, they did not have sufficient information. Based on their results, researchers have suggested that studies should be carried out, especially in terms of digital health and digital rights and responsibilities. Takavarasha, Cilliers, and Chinyamurindi (2018) observed that the participants had problems in the digital security dimension. Similarly, Yalçınkaya and Cibaroğlu (2019), working on the sub-dimensions of digital citizenship recently, emphasized that the participants have deficiencies, especially in digital health.

1.3 Problems in digital citizenship education

Adopting the concept of digital citizenship from an early age and raising awareness on this issue is important in terms of both reducing the problems that children and young people can experience in a virtual environment (Karaduman & Öztürk, 2014; Palfrey & Gasser, 2011) and developing this culture. Researches especially emphasize the importance of helping students to be the right digital citizen (Farmer, 2010). Hollandsworth, Donovan, and Welch (2017) indicated that digital citizenship should be taught at a young age, and it is important to raise awareness of digital citizenship among educators and administrators. Accordingly, teachers, administrators, technology leaders, and parents should be supported to obtain the information they need to use digital technologies correctly (Gazi, 2016). It should not be forgotten that especially teachers have a big role in informing students and young people correctly. Given all that has been mentioned so far, one may suppose that teacher candidates' and teachers' awareness about digital citizenship is insufficient in the early studies, whereas in some studies conducted between 2015 and 2017 this situation has changed in a positive way. However, in recent studies, the researchers focused on the sub-dimensions of digital citizenship and they showed that the participants still do not have enough information about the concept of digital citizenship.

Many recent studies (Engin & Sarsar, 2015; Kabataş, 2019; Kaya & Kaya, 2014; Özer, 2016; Takavarasha et al., 2018; Vural & Kurt, 2018; Yalçınkaya & Cibaroğlu, 2019), have shown that the level of perceptions of teacher candidates and teachers' digital citizenship concept is still a problem. As for the sub-dimensions of digital citizenship, it is obvious that although there is an increase in the number of recent studies, it is still not sufficient. On the other hand, the vast majority of studies on digital citizenship have been quantitative and much of the research has focused on evaluating the scales. In some studies, scale evaluation results were supported by qualitative interview data. However, at the

stage of collecting data, no different approach was taken. This situation makes it difficult to determine where the deficiencies in the concept of digital citizenship and its sub-dimensions originate from. In addition to these mentioned problems, another remarkable point is that no solution has been proposed other than adding this concept to the curriculum to overcome the lack of information about digital citizenship.

1.4 Research questions

In light of the problems mentioned in the previous section, the main purpose of this study is to determine the digital citizenship levels of ICT teacher candidates and to compare them with their user behaviours and habits in the digital world. In line with the determined basic purpose, answers to the following research questions were sought:

1) What is the level of digital citizenship of ICT teacher candidates?
2) Do the digital citizenship levels of ICT teacher candidates and digital technology usage behaviours and habits show similarities?

2 Methodology

2.1 Research design

A mixed-method approach was used to obtain further in-depth information on problems and deficiencies of digital citizenship. This method is particularly useful in studying the use of quantitative and qualitative data together. Within the scope of the research, the digital citizenship knowledge levels of the participants were determined by the help of a Digital Citizenship Scale (DCs). Then, participants were asked to examine a mobile application called e-Citizen, which explained the concept of digital citizenship and its sub-dimensions. The data gathered from the e-Citizen mobile application about participants' user behaviours and habits on digital technology was stored in a database. In research, firstly, the process of collecting quantitative data, and then qualitative data was carried out. However, qualitative data were not planned to support quantitative data. For this reason, "Transformative Sequential Design" was chosen as a research design within the mixed method. The transformative sequential design allows the data to be collected in quantitative-qualitative or qualitative-quantitative order and to be combined in the analysis section.

2.2 Participants

Seventy-four participants studying at Computer Education and Instructional Technologies Department at Marmara University in the 2019-2020 academic year were recruited for this study. Just over half the sample (53%; 39 participants) was male and others female (47%; 35 participants).

2.3 Data collection tools

2.3.1 Digital Citizenship Scale (DCs)

Quantitative data were collected using the Digital Citizenship Scale (DCs) developed by Kocadağ (2012). The construct validity of the scale, which was developed to determine the digital citizenship levels of teacher candidates, was tested by Kocadağ (2012) through factor analysis. As a result of the exploratory factor analysis, it was determined that the scale consists of 63 items and 7 dimensions (Kocadağ, 2012). The scale's dimensions were expressed as follows: (i) digital communication and literacy features, (ii) digital etiquette and law features, (iii) digital access features, (iv) digital rights and responsibilities features, (v) digital health features, (vi) digital security features, and (vii) digital commerce features. The scale has a 5-point Likert type scoring system. Participants can get a maximum of 315 points and a minimum of 63 points from the scale. In determining the digital citizenship levels of the participants within the scope of their scores, the evaluation method put forward by Kocadağ (2012) is given in Table 1.

Table 1

Digital citizenship scale levels and score ranges

Level	*Score Range*
Extremely Week	63 – 98
Too week	99 – 134
Week	135 – 170
Intermediate	171 – 206
Good	207 – 242
Very Good	243 – 278
Extremely Good (Excellent)	279 – 315

2.3.2 Mobile application: e-Citizen

The e-Citizen is a mobile application developed by researchers to teach individuals the concept of digital citizenship and its nine sub-dimensions. In addition to being an educational application, the e-Citizen application allows us to detect some mistakes that individuals make in the digital world. In this way, qualitative data were collected using this application. HTML5, JavaScript, and Google Firebase technologies were used during the development of the mobile application. Sample screenshots of the e-Citizen application are given in Figure 1.

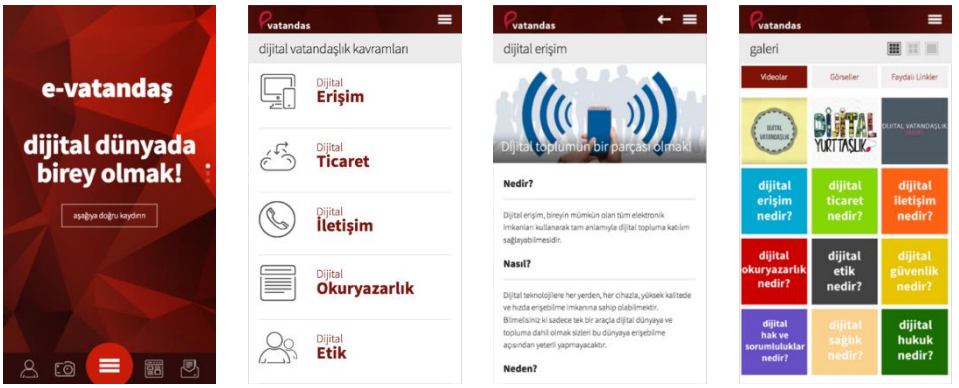

Figure 1. e-Citizen mobile application sample screenshots.

2.3.3 User habits and behaviours surveys (UHBs)

To determine the user habits and behaviours of the ICT teacher candidates on the digital world, short questionnaire items, and qualitative questions were added to the end of the lessons in the e-Citizen application. Some of the questions posed to the participants are open-ended, some are multiple-choice and some are designed in such a way that more than one option can be preferred. The questionnaire items and qualitative questions directed to participants were arranged to coincide with the items included in the Digital Citizenship Scale developed by Kocadağ (2012), thus, data diversification was made.

2.4 Data collection process

A scenario was designed to ensure the naturalness, neutrality, and accuracy of the data to be obtained from the participants. According to this scenario, the faculty member teaching the course of ICT teacher candidates; first asked a few questions that tested the students' concept of digital citizenship. Then she said that students can learn their level with the Digital Citizenship Scale. And, she applied the scale to those who voluntarily wanted it. Then, she mentioned that a postgraduate student has developed a mobile application named e-Citizen that provides digital citizenship education and this application was still in the testing phase. Also, she said that those who wanted can examine this application by installing it on their smart-phones, evaluate the contents, and increase their knowledge about digital citizenship. Finally, she mentioned that those who wish could give feedback on the application and content from the communication menu.

3 Findings

3.1 Digital citizenship levels of ICT teacher candidates

RQ1: What is the level of digital citizenship of ICT teacher candidates?

To determine digital citizenship levels of ICT teacher candidates, the Digital Citizenship Scale (DCs) was used. Table 2 shows the quantitative data on the digital citizenship levels of participants.

Table 2

Digital citizenship levels of the participants

Level	*Participants*	*Percentage (%)*	*Average DCs Score*
Extremely weak	0	0 %	0
Too weak	0	0 %	0
Weak	1	1.35 %	145
Intermediate	0	0 %	0
Good	11	14.86 %	227
Very good	43	58.11 %	261
Extremely good (Excellent)	19	25.68 %	290
Total	74	100 %	262

As can be seen from Table 2, digital citizenship levels of ICT teacher candidates were at a very good level with an average of 262 points. Considering the digital citizenship levels of all participants (n = 74), it was found that 83.79% of teacher candidates were at a very good and higher level, while only one (1) person was at the weak level.

The results obtained from DCs were handled within the scope of the seven sub-dimensions and it has been shown in Table 3. The lowest score and the highest score represent the minimum and maximum score that can be taken from the dimensions in the scale.

Table 3

Average scores obtained from sub-dimensions of DCs

Sub-dimensions	*Lowest Score*	*Highest Score*	*Participants' Average Score*
Digital Access	7	35	30.03
Digital Etiquette and Law	16	80	68.56
Digital Security	5	25	21.59
Digital Rights and Responsibilities	3	15	11.46
Digital Communication and Literacy	24	120	102.16
Digital Health	5	25	18.96
Digital Commerce	3	15	13.16

Table 3 provides an overview of the knowledge level of teacher candidates on digital citizenship sub-dimensions. It can be seen that the participants achieved the highest average in digital communication and literacy with 102.16 points and the lowest average in digital rights and responsibilities with 11.46 points.

3.2 Digital technology usage habits and behaviours of ICT teacher candidates

RQ2: Do the digital citizenship levels of IT teacher candidates and digital technology usage behaviours and habits show similarities?

Section 1

The process of determining the answer to this research question consists of two parts. Firstly, data that could shed light on the behaviours and habits of the participants were obtained during the installation and membership registration of the e-Citizen mobile application.

During the e-Citizen installation phase, the participants were asked to give permissions such as access to microphones, contacts, and photos which are outside the scope of the application. In this way, the knowledge levels and awareness of the ICT teacher candidates about digital security were measured. No information was provided to the participants during the request of these permissions. Whether the participants checked the access privileges requested by the mobile application was recorded based on their statements.

Table 4

Participants' status of questioning the permissions requested by the mobile application

	Number of Participants (%)
Those who check permissions	4 (5.40%)
Those who do not check permissions	70 (94.60%)

It can be seen from the data in Table 4 that 94.60% of the participants who used the application did not provide any feedback regarding the permissions. On the other hand, a minority of the participants (5.40%) asked researchers some questions about why these permissions were requested. These questions can be summarized as follows: “Why does this application require microphone access?, What is the purpose of reaching our contacts?” Also, one individual stated that the permissions requested did not match the purpose of the mobile application.

As with almost every mobile application, there was a "User Rights and Agreement" menu/window in the e-Citizen application. By the help of this menu/window, data were obtained to determine the behaviours and habits of the participants in the sub-dimension of user rights and responsibilities. The data as to whether the users have opened the agreement menu, and how long they remained on the screen if they opened the window, were recorded.

Table 5

Participants' status of reading "User Rights and Agreement"

	Number of Participants (%)	*Average Reading Time*
Those who read the agreement	2 (2.70%)	3,05 sec.
Those who do not read the agreement	72 (97.30%)	0

Table 5 shows that 97.30% of teacher candidates never opened the contract. Besides, the average duration of reading the agreement for the two participants was found to be 3.05 seconds. This result is somewhat counterintuitive.

Section 2

In the second part, the relationship between participants' digital citizenship levels and their user behaviours and habits in the digital world were analyzed using DCs and UHBs data. While the DCs questions utilized a 5-point Likert scale, UHBs questions were open-ended, multiple-choice, or designed in such a way that more than one option could be preferred. Therefore, to compare the data obtained from the DCs with the data obtained from the UHBs, a normalization study was conducted. Normalization allows comparing the data obtained from two different data collection tools evaluated with different scoring systems in a single frame. After the normalization study, the data obtained from DCs and UHBs were handled in the range of 0 to 1.

Two different questions were asked to the participants at the end of the digital access subject in the e-Citizen mobile application. Question 1: "Which of the following devices and digital technologies do you have?" and Question 2: “We think that you do activities such as research, homework, and exchange of ideas through digital technologies. So, which methods do you prefer?” The first graphic in Figure 2 shows the distributions of digital technologies that the participants possess. The relational results of the DCs and UHBs are given in Figure 3.

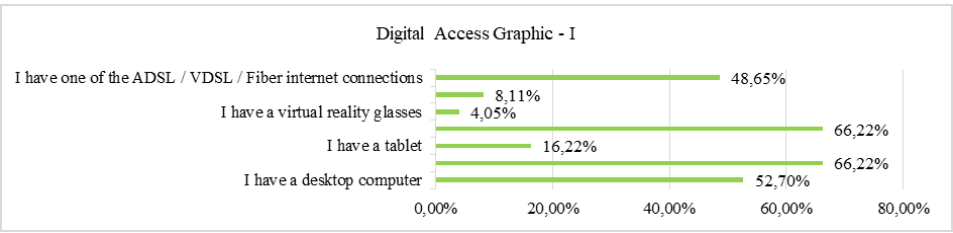

Figure 2. Distribution of digital technologies owned by the participants.

From the graph above we can see that 66.22% of the users had both a laptop and a smart-phone as a result of the data obtained by the UHBs but do not take place in the DCs. What is interesting about the data in this table is that 48.65% of users have access to the internet at home.

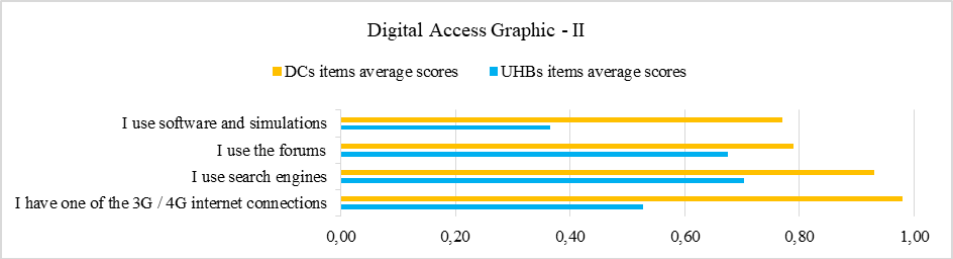

Figure 3. Relationship graphic in digital access sub-dimension.

As shown in Figure 3, it is seen that the habits of the participants in using search engines and forums were relatively consistent with the answers they give on DCs, but the data did not overlap with the use of software and simulations. On the other hand, it was determined that DCs and UHBs data did not show consistency in terms of participants having a mobile internet connection.
The questions posed to the participants within the scope of the digital etiquette dimension were as follows; Q1: "Which of the options below do you think should be considered within the context of digital ethics?" and Q2: "Well, which of the following do you think is not ethical?" Relational results are given in Figure 4.

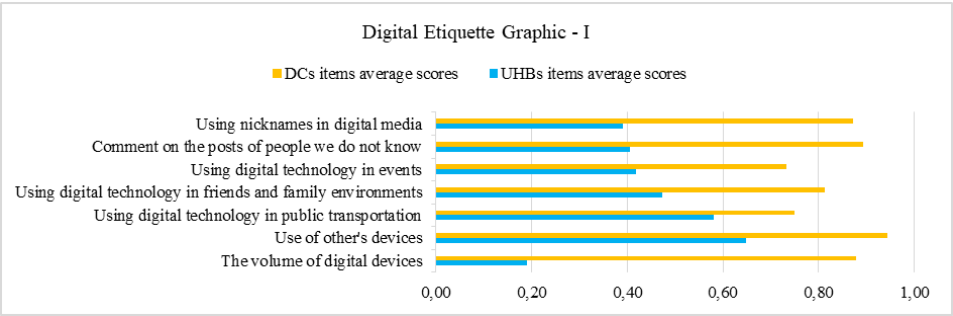

Figure 4. Relationship graphic in digital etiquette sub-dimension.

The figure above illustrates that the participants are relatively sensitive about the use of others' devices. On the other hand, from the data in Figure 4, it appears that there is a weak overlap between participants' digital citizenship levels and their user behaviours and habits on the usage of digital technology. ICT teacher

candidates have achieved high scores on the "I use my real name when communicating in digital media" item on DCs, but the majority of participants thought that using nicknames in digital media should not be considered within the scope of digital etiquette. A similar situation can be seen in other topics such as comments on posts of people they do not know or the sound volume of digital devices in society.

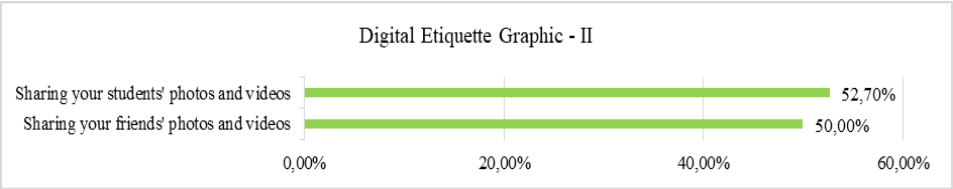

Figure 5. Digital etiquette data graphic.

As can be seen from Figure 5, the most striking result to emerge from the data is that only half of the teacher candidates think that sharing videos or photos of their friends and students without permission from them is ethical (50.00% for friends and 52.70% for students).

Two different questions were asked to the participants at the end of the digital law subject in the e-Citizen mobile application. Q1: “Which of the following concepts do you think you have sufficient knowledge about?” and Q2: “We carry out different works and shares with digital technologies every day. So, which of the following do you pay attention to?” The relational results of the DCs and UHBs are given in Figure 6.

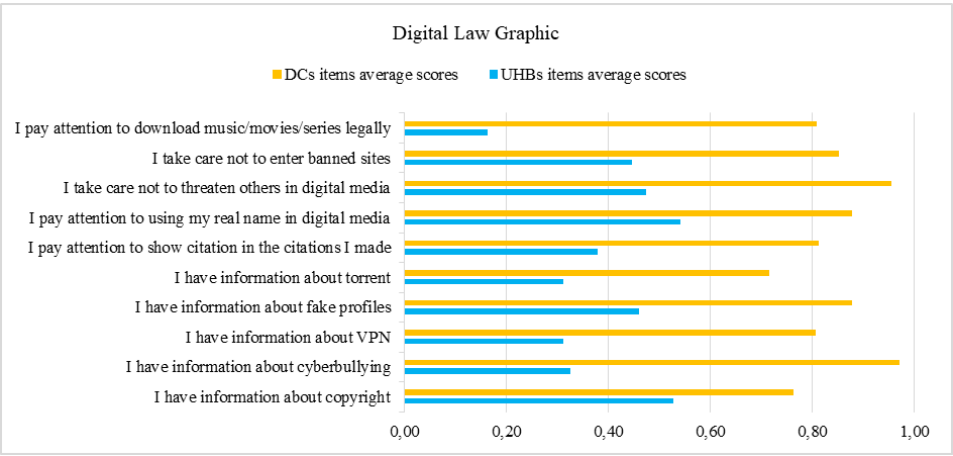

Figure 6. Relationship graphic in digital law sub-dimension.

Figure 6 shows that the scores given by participants to the digital law items of DCs are quite high. For instance, ICT teacher candidates obtained a high score (4.53) on the item "I take care to act under the laws set by the state in a virtual environment" in DCs. In contrast, in the answers given to the UHBs, it is seen that they are not sensitive enough about digital law. It can be seen from the data in Figure 6 that less than half of the participants stated that they were careful not to enter banned sites. Also, the rate of those who state that they have knowledge about cyberbullying is only 32.43%. At the same time, over one-third of the participants (37.70%) stated that they pay attention to referring to their studies, while the percentage of teacher candidates who said "I pay attention to downloading music/movies/TV series legally" is quite low (16.22%). These are remarkable results.

The questions posed to the participants within the scope of the digital security dimension were as follows; Q1: "We have listed some security protocols/concepts for you. Which of these are you familiar with?" and Q2: "Which of the following habits do you have when using digital technologies?" Relational results are given in Figure 7. In the second graphic in Figure 8, the distribution of the digital security concepts that the participants are familiar with is shown.

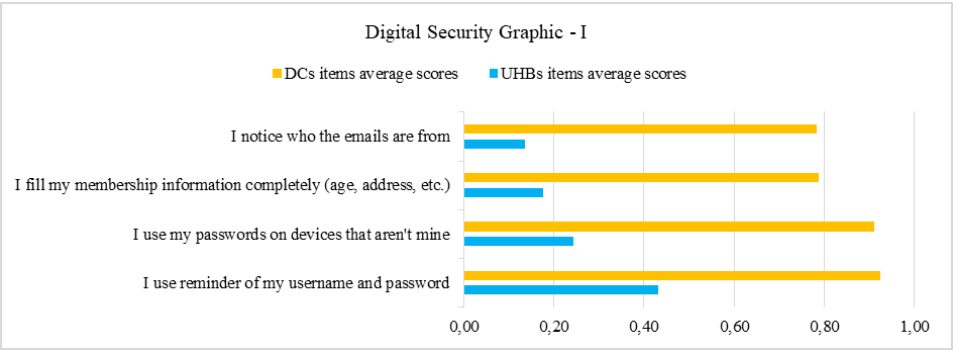

Figure 7. Relationship graphic in digital security sub-dimension.

From the graph above we can see that the scores given by the participants to the digital security items are quite high. However, there is a discrepancy between the participants' levels of digital citizenship and behaviours and habits on the usage of digital technology. To illustrate, only 17.57% of teacher candidates stated that they have completely filled their membership information on the websites. Although this is a positive situation in terms of digital security, almost half of the participants indicated that they use the username and password reminder feature on digital devices. Similarly, the percentage of participants said that they used their passwords on devices that did not belong to them was low

(24.32%), but the majority of teacher candidates (86.49%) stated that they did not pay attention who sent the e-mail.

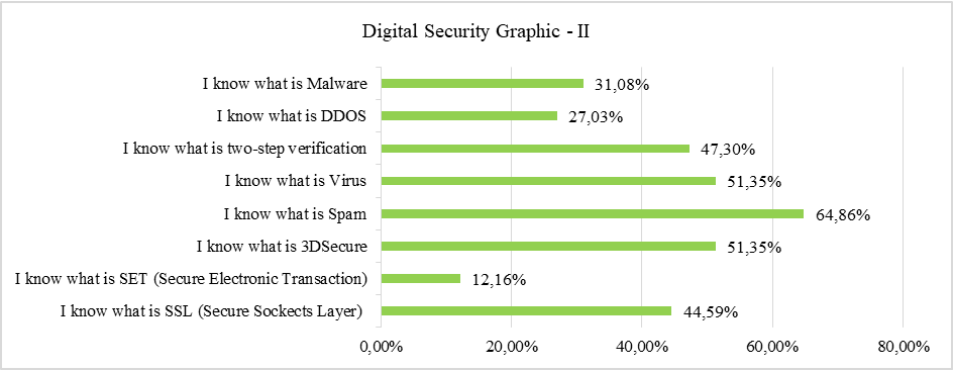

Figure 8. Relationship graphic in digital security sub-dimension.

Figure 8 shows an overview of the participants' awareness of digital security protocols. As seen in Figure 8 the participants partially know common concepts such as viruses, spam, and 3DSecure, but they do not have sufficient information about security protocols and security threats.

Two different questions were asked to the participants at the end of the digital literacy subject in the e-Citizen mobile application. Q1: "Which of the digital citizenship skills do below do you think you have?" and Q2: "So, which of the digital tools below can you use?" The relational results of the DCs and UHBs are given in Figure 9.

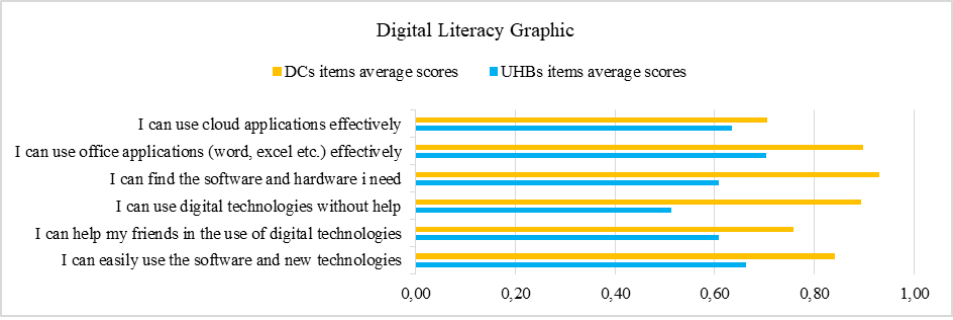

Figure 9. Relationship graphic in digital literacy sub-dimension.

As seen above from Figure 9, there is a consistency between the participants' levels of digital literacy and behaviours and habits on using digital technology.

The vast majority of participants considered themselves adequate about office applications and cloud applications.
The questions posed to the participants within the scope of the digital health dimension were as follows; Q1: “Some health problems experienced while using digital technologies are given below. Do you have any of these problems?” and Q2: “We can also say that digital technologies force people psychologically. Do you think that you are experiencing the following due to digital technology?”. Relational results are given in Figure 10. The distributions related to the health problems experienced by the participants are shown in Figure 11.

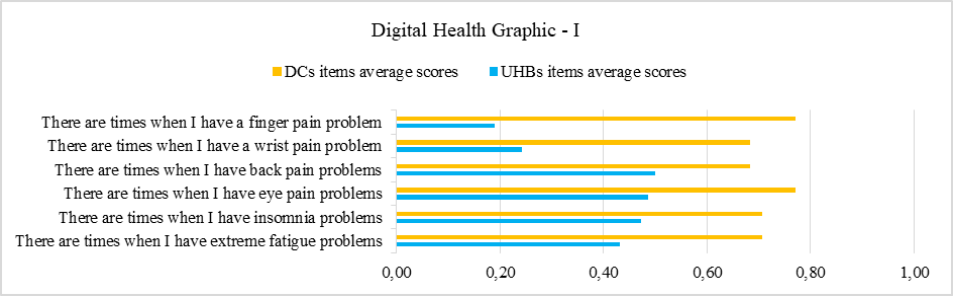

Figure 10. Relationship graphic in digital health sub-dimension.

It can be seen from the data in Figure 10 that the scores given by the participants to digital health items in DCs are relatively low compared to other dimensions. Nonetheless, participants have scored above the average for the item "I do activities that will keep me fit so that I do not experience uncomfortable situations such as fatigue, insomnia, distractibility during the use of digital devices". In contrast, in the answers given to the UHBs, the rate of those who stated that they had problems such as insomnia and excessive fatigue was 47.98%. Similarly, while the participants give a high score for the item “I will determine a correct sitting position when using a computer”, the participants who say they have problems such as shoulder, back, or eye pain are remarkably high.

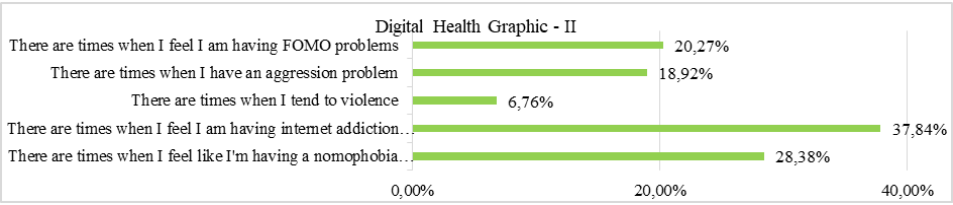

Figure 11. Digital health data graphic.

The results obtained from the analysis of psychological health survey data are summarized in Figure 11. As can be seen from figure 11, 37.84% of the participants thought that they were addicted to the internet, while 28.38% thought they had a nomophobia problem.

Two different questions were asked to the participants at the end of the digital commerce subject in the e-Citizen mobile application. Q1: "Which of the following trade and payment methods do you use?" and Q2: "Some components used in digital commerce are listed below. Which of these do you recognize?" Relational results are given in Figure 12.

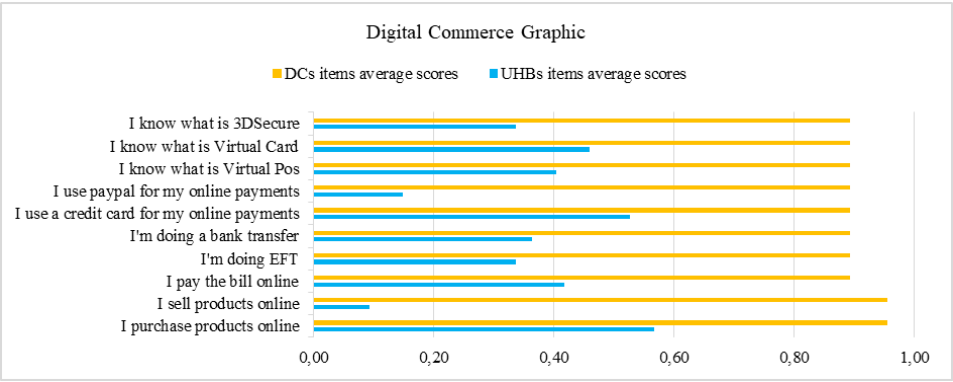

Figure 12. Relationship graphic in digital commerce sub-dimension.

As shown in Figure 12, the scores given by the participants to digital commerce items in DCs are quite high. A fairly above score (4.78) has given for the item that "I can do my online banking transactions, bill payments, and shopping when I need it" in the DCs by participants. However, in the responses given to the UHBs questions, it is seen that they do not perform banking transactions via digital ways or do not have enough information about this subject. Similarly, the data in Figure 12 shows that users have little knowledge of virtual shopping payment methods.

The questions posed to the participants within the scope of the digital rights and responsibilities dimension were as follows; Q1: "Do you pay attention to the one's factors while using digital technologies?" and Q2: "Do you know that you have responsibilities and rights against the mobile application you use?" UHBs items to determine user habits and behaviours in this dimension are not directly related to the items in the DCs. Since all three items in the DCs contain general expressions, the items in the UHBs were prepared per the content of the subject in terms of rights and responsibilities. The graph of the data obtained from the participants is shown in Figure 13.

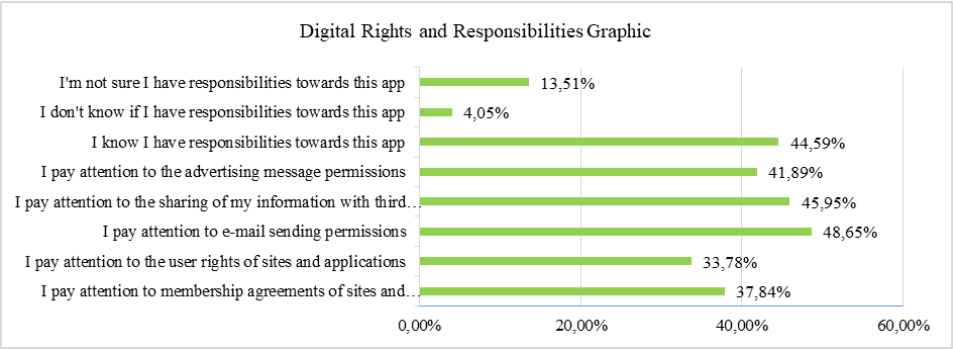

Figure 13. Digital rights and responsibilities data graphic.

In Figure 13 it is clear that participants do not pay attention to the membership agreements of websites and mobile applications. Similarly, just about one-third of the participants stated that they paid attention to user rights on websites and mobile applications. Besides, more than half of the participants (51.35%) do not pay attention to e-mail sending permissions. On the other hand, less than half of ICT teacher candidates (44.59%) know that they have responsibilities towards the mobile application (e-Citizen) they use.

Two different questions were asked to the participants at the end of the digital communication subject in the e-Citizen mobile application. Q1: "Which of the following digital communication channels do you use?" and Q2: "So which of the digital communication and sharing applications do you use?". UHBs items to determine user habits and behaviours in this dimension are not directly related to the items in the DCs. Since all three items in the DCs contain general expressions, the items in the UHBs were prepared per the content of the subject in terms of communication. The graph of the data obtained from the participants is shown in Figure 14.

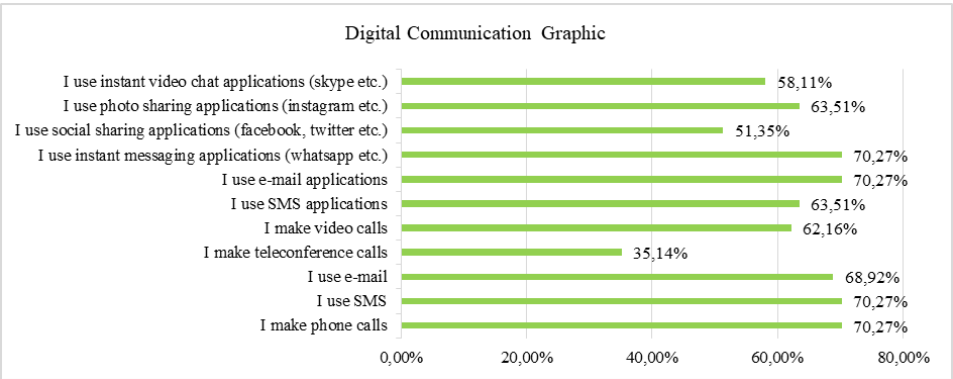

Figure 14. Digital communication data graphic.

As can be seen from Figure 14, participants use most of the digital communication technologies. In the digital communication sub-dimension, it can be stated that the participants have high awareness.

4 Discussion

4.1 Discussion

The main purpose of this study was to examine the relationship between digital citizenship knowledge levels of ICT teacher candidates and their digital technology usage habits. The results of this study were discussed in three sections. Firstly, the results of the digital citizenship levels of the participants were provided. Secondly, the details of the sub-dimensions showing consistency as a result of comparing the digital citizenship levels of the teacher candidates and the habits of using digital technologies were given. Lastly, the results of the sub-dimensions showing inconsistency were given.

In the first part of the study, it was specified that the average digital citizenship score of 74 ICT teacher candidates participated in the study was found to be 262 and it was described as "Very Good" according to the DCs. It is noteworthy that only one person from the participating group had a poor digital citizenship level. These results corroborate with the findings of a great deal of the previous works that show that digital citizenship levels of individuals have increased in recent years (Choi et al., 2018; Gazi, 2016; Kabataş, 2019; Sakallı & Çiftçi, 2016). A possible explanation for these results may be due to the participants' studying in the department of Computer Education and Instructional Technologies. Participants may have seen themselves very adequate in digital citizenship, which is a related topic to the field in which they are studying, however, data obtained from user habits and behaviours did not support this situation. This inconsistency may be due to the participants not acting objectively during scale scoring. The reason for this is not clear, but we thought possible causes may be that teacher candidates may not express their real thoughts, may not want to get low scores on DCs or they may see themselves adequate despite their deficiencies. This situation is one of the biggest limitations of self-report measures and it is named "Social Desirability Bias" in the literature (Erten, 2015; Porter, 2011). If such a possibility exists, the scales and answers filled by the participants will have to be questioned. There are, however, other possible explanations. In the study, participants have filled the DCs first and then used the e-Citizen application. ICT teacher candidates have taken lower scores from UHBs in each of the sub-dimensions compared to DCs. According to these data, we can infer that the participants may be able to increase their knowledge about digital citizenship and see their deficiencies thanks to the e-Citizen mobile application. It should not be forgotten that the mobile application was developed

to provide digital citizenship education, and at this point, it may have helped teacher candidates gain more awareness and see their deficiencies.

In the second part, the titles that showed consistency as a result of comparing the scores obtained by the participants from the sub-dimensions of the DCs and the habits of using digital technologies were examined. The results of this study indicated that in digital literacy, digital communication, and digital access sub-dimensions, participants' high scores on the DCs and the UHBs show positive consistency. For instance, it has been determined that the participants' habits of using search engines, software, and cloud technologies in the digital literacy dimension are high. These results are in line with those of previous studies that concluded that the participants are generally at a good level in digital literacy (Choi et al., 2018; Vural & Kurt, 2018). The relatively inadequate issue at the end of the research was the participants' use of new technologies without assistance. Nevertheless, when the participants were asked "what skills do you think a good digital literate should have?", the majority commented that a good digital literate should have skills such as "keep their data safely, follow the new technologies and developments, do have not a difficulty in accessing information, confirm the knowledge obtained from different sources".

Considering the user behaviours in the digital communication dimension, it was seen that the majority of participants had a good level of knowledge. This study confirms current researches (Torun, 2020) that students use digital communication channels and social media tools to a large extent and follow the developments. The participants on the whole stated that they preferred digital communication methods for reasons such as "saving time and cost, communicating quickly and facilitating accessibility". In the previous studies, Kocadağ (2012) combined the communication dimension with another dimension, Vural and Kurt (2018) stated that the communication dimension should be evaluated separately from digital citizenship. However, these findings may help us to understand the development of digital communication tools and the new problems they may pose. Young people who prefer digital communication methods should use these communication tools consciously and have sufficient knowledge about the problems they may encounter.

The current study found that digital access is another dimension that shows consistency between DCs and UHBs. According to the data, the vast majority of participants do not have problems accessing digital technologies and the internet. Besides, it was determined that the participants had access to many different digital technologies. This situation appears as a result of the increasing spread of digital technologies and becoming an indispensable part of life. There were some suggestions from participants about this dimension. Some ICT teacher candidates argued that "social media applications, cloud technologies, smart-phone reception" can be evaluated within the scope of digital access.

Finally, in the third section, the titles that showed inconsistency as a result of comparing the scores obtained by the participants from the sub-dimensions of

the DCs and the habits of using digital technologies were examined. Findings revealed that teacher candidates did not have enough information in six sub-dimensions of digital citizenship: security, health, rights and responsibilities, law, etiquette, and commerce, or do not display the correct user behaviour. For instance, the participants were careless about the requested permissions during the installation of the e-Citizen mobile application. Only four participants paid attention to this point. Similarly, although the DCs scores obtained from the digital security sub-dimension of the teacher candidates included in the study were high, they have shown that there were deficiencies in the user habits and behaviours in the security dimension. This finding is consistent with the results of Takavarasha et al. (2018) who revealed that there are problems in digital security. However, in this study, the sources of the problems were tried to be explained. According to the findings, the most striking result is that the basic habits of the participants, especially during the daily use of the technology, are wrong and they have insufficient knowledge about the security protocols. One of the main reasons behind these behaviours may be the idea that "it is not possible to be safe in the digital world" as the majority of the participants stated within the scope of the open-ended question. Another possible explanation is that the installation of a mobile application is now a daily routine. The main factor causing this routine is that mobile applications cannot be installed if necessary permissions are not given.

The most obvious finding to emerge from the analysis is that the vast majority of participants (97.30%) have not opened the user rights and agreement menu. Only two teacher candidates read the user agreement but it was recorded that their average reading time was 3.05 sec. This is an unexpected outcome. Similarly, as a result of the data obtained from the items in UHBs, it was determined that the participants did not have sufficient information about their rights and responsibilities in the digital world. These results support those of Vural and Kurt (2018) who also found that there was a problem with digital rights and responsibilities. The ICT teacher candidates stated the causes of the problems they faced in terms of digital rights and responsibilities with the open-ended question. A common view amongst participants was that user agreements on mobile applications or websites are not written in clear language. Only a small number of respondents indicated that they are not informed clearly by online platforms on the point of sharing information. These findings will be having important implications on efforts to improve awareness of user rights and responsibilities.

Another important finding was that there is also an inconsistency in the digital etiquette dimension. The results of this study indicated that the participants were not conscious enough especially of the use of digital technologies in society and cyberbullying. It is a striking result that only half of the participants do not find it ethical to share their friends' and students' photos/videos without permission. In some studies, in the literature, it is seen that the etiquette sub-dimension was

combined with different sub-dimensions and dealt with under a new dimension (Oyademi, 2012; Vural & Kurt, 2018). However, the findings of the current study do not support the previous research. The majority of participants agreed with the statement that they faced unethical situations in the digital world. For this reason, it is a fact that it is necessary to carry out more comprehensive studies on ethical sub-dimension. Besides, a possible explanation for these results may be the lack of information about the scope of digital ethics.

In the context of digital law, the knowledge of participants was insufficient as in the etiquette dimension. Surprisingly, a majority of respondents stated that they did not pay attention to refer to the quotations they made. Similarly, almost half of the participants indicated that they did not have information about copyright terms. Another important finding was that the rate of participating in illegal activities during the use of digital technologies of the teacher candidates was considerably high. Notwithstanding, the results of this study showed that participants' level of knowledge about cyberbullying was also insufficient. Vural and Kurt (2018) stated that the subject of digital law is not under any dimension in their research and this may be due to the fact that it is not yet aware of the legal regulations in the field of information technologies. The vast majority of teacher candidates stated that a separate law was needed for digital technologies and made suggestions on the topics that may be included in its scope. This finding broadly supports the work of other studies in this area (e.g. Vural & Kurt, 2018). At this point, there are two possible reasons why participants may have problems. A possible explanation for this might be that there is indeed a deficiency in the point of digital law. Another possible explanation for this is that the participants may have a lack of information about the regulations and laws.

On the dimension of digital health, this study found that most of the participants experienced physical problems such as shoulder, back, and eye pain, even though they scored very high on DCs. In addition to this result, 37.84% of the participants considered that they had internet addiction problems. Similarly, the participants believed that they had different psychological problems such as aggression, nomophobia, and FOMO. These results corroborate with the findings of a great deal of the previous works which reported identical problems in the digital health dimension (Vural & Kurt, 2018; Yalçınkaya & Cibaroğlu, 2019). There are several possible explanations for this result. One of the possible causes of these results is explained in the answers to the open-ended question addressed to ICT teacher candidates. The majority of those who responded to this item stated that there was a lack of information at an adequate level from the authorities regarding the conscious use of digital technologies. Another possible reason may be that the health problems experienced are ignored by individuals.

One unanticipated finding was that there was an inconsistency in the digital commerce sub-dimension. The participants' level of digital commerce was remarkably high according to DCs scores. However, the results obtained from

the UHBs items showed inconsistency with these high scores. The results of this study indicated that teacher candidates had insufficient information especially about security protocols in the digital commerce dimension. Another important finding was that participants do not have enough competencies to take measures against possible problems. As part of the open-ended question asked in the digital commerce dimension, the vast majority of the participants stated that they prefer "reliable shopping sites, take customer reviews and ratings into account" while shopping in the virtual environment. However, it is seen that there is a lack of information about the features of reliable shopping sites.

4.2 Future research directions

The findings of this study have a number of practical implications for digital citizenship. In light of the data described in the findings section and the possible problems mentioned in the discussion section of the study, some suggestions were made to guide the teachers, administrators, and researchers in future studies.

Adopting the concept of digital citizenship from an early age and raising awareness on this issue is important to the point of reducing the problems that children and young people can experience in the virtual environment (Karaduman & Öztürk, 2014; Palfrey & Gasser, 2011). Farmer (2010) stated that it is important to help students be the right digital citizen. At this point, the biggest share belongs to educators, namely teachers. But, firstly, teacher candidates and teachers should be good digital citizens. In this regard, educators should primarily conduct studies that can ensure their development. Then, they can contribute to students by developing awareness-raising educational content, activities, and applications on digital citizenship.

At the point of raising awareness of educators, the main task falls on managers. School administrators, university administrators, higher education institution officials, ministry officials, ministers, and other educational institutions of the state, which are in the management section of the education world, should carry out comprehensive and systematic studies to raise the awareness of teacher candidates and teachers about digital citizenship. According to the findings, a vast majority of participants indicated that they have not been informed by authorities about digital citizenship and its sub-dimensions. From this point of view, it is recommended that administrators prepare comprehensive and systematic information content and present these contents not only as printed material but also in the form of in-service training. Besides, the developed content can be supported by educational virtual projects, videos, augmented reality applications, and mobile applications. At the same time, these contents can be used as educational content not only for educators but also for all individuals in society. Studies to be carried out in this area may enable members of society to become digital citizens over time and systematically.

This study has gone some way towards enhancing our understanding of digital citizenship and its sub-dimensions. As can be seen in the current research, there are inconsistencies between participants' digital citizenship levels and their user behaviours and habits in terms of the concept. However, in many studies, it is known that only scales are used and in some studies, scale results are supported with qualitative data. The results of this study indicate that the participants may not make correct scoring in the scales or that they may lack what they thought they knew. It is recommended that researchers use different types of data collection tools during data collection for future studies. In this way, it might be possible to determine the behaviours of the participants in the real world by making data diversification. Also, further research needs to be carried out to determine how students can be effectively educated on the concept of digital citizenship. The e-Citizen mobile application was developed to provide digital citizenship education in the scope of research and the majority of the participants stated that they found the application informative and effective. In future studies, similar applications can be developed to raise awareness of participants on digital citizenship. Besides, there is not a consensus among researchers on the definition of the concept of digital citizenship (Yalçınkaya & Cibaroğlu, 2019). As stated by Hamutoğlu and Ünal (2015), to develop a full picture of digital citizenship, additional studies will be needed that determine the concept of digital citizenship and the right behaviours of a digital citizen. This is an important issue for educators, administrators, and researchers. Finally, further studies with more focus on sub-dimensions of digital citizenship are therefore suggested. Several studies have used the sub-dimensions of digital citizenship combined with other dimensions or excluded out of scope (Kocadağ, 2012; Oyademi, 2012; Vural & Kurt, 2018). However, the results of this study showed that there are big problems in six of the nine sub-dimensions. Although participants' knowledge level in the other three sub-dimensions seems relatively higher, there are deficiencies in these sub-dimensions as well. There are still many unanswered questions about the sub-dimension of digital citizenship.

Conclusion

The main question raised by this study is whether ICT teacher candidates' digital citizenship levels show consistency with their user behaviours and habits in the digital world. The research data in this paper were obtained from two main sources: The Digital Citizenship Scale and e-Citizen mobile application. By comparing these data obtained from two different data collection tools after normalization studies, analyses were carried out and the findings of the research were shared.

Overall, this study strengthens the idea that there are problems in the concept of digital citizenship and its sub-dimension. As a result of the research, although the digital citizenship levels of the participants were measured to be very good, it was determined that there are inconsistencies with their behaviours and habits

during the use of digital technologies in six of the nine sub-dimensions (security, health, rights and responsibilities, law, etiquette, and commerce). In three sub-dimensions: digital communication, access, and literacy, the data were relatively consistent. At the end of the study, the possible causes of the digital citizenship misconception experienced by teacher candidates were discussed separately and suggestions were made for future studies.

It should not be forgotten that this study was limited by the validity and reliability of the digital citizenship scale, the efficiency of the mobile application, and the level of knowledge of the participant group and their objectivity in their answers.

References

Buente, W. (2011). *Modeling Citizenship Offline and Online: Internet Use, Information, and Political Action during the 2008 Election Campaign* (Doctoral dissertation). Indiana University.

Choi, M. (2016). A concept analysis of digital citizenship for democratic citizenship education in the internet age. *Theory & Research in Social Education, 44*(4), 565-607.

Choi, M., Cristol, D., & Gimbert, B. (2018). Teachers as digital citizens: The influence of individual backgrounds, internet use and psychological characteristics on teachers' levels of digital citizenship. *Computers & Education, 121,* 143-161.

Choi, M., Glassman, M., & Cristol, D. (2017). What it means to be a citizen in the internet age: Development of a reliable and valid digital citizenship scale. *Computers & Education, 107,* 100-112.

Çepni, O., Oğuz, S., & Kılcan, B. (2014). Ilköğretim Öğrencilerinin Dijital Vatandaşliğa Yönelik Görüşleri. *Turkish Journal of Social Research/Turkiye Sosyal Arastirmalar Dergisi, 18*(3).

Çubukcu, A., & Bayzan, Ş. (2013). Türkiye'de dijital vatandaşlık algısı ve bu algıyı internetin bilinçli, güvenli ve etkin kullanımı ile artırma yöntemleri. *Middle Eastern & African Journal of Educational Research, 5,* 148-174.

Elçi, A. C. (2015). *Bilişim teknolojileri ve yazılım dersi öğretim programına yönelik öğrenci görüşlerinin dijital vatandaşlık bağlamında incelenmesi.* (Master thesis). Adana: Çukurova Üniversitesi.

Elçi, A. C., & Sarı, M. (2016). Digital citizenship in the Information Technology and Software course: A scale development study. Bilişim Teknolojileri ve Yazılım dersinde dijital vatandaşlık: Bir ölçek geliştirme çalışması. *Journal of Human Sciences, 13*(2), 3602-3613.

Engin, G., & Sarsar, F. (2015). Sınıf öğretmeni adaylarının küresel vatandaşlık düzeylerinin incelenmesi. *International Journal of Human Sciences, 12*(1), 150-161.

Erten, İ. H. (2015). Social desirability bias in altruistic motivation for choosing teaching as a career. *Hacettepe University Journal of Education, 30*(1), 77-89.

Farmer, L. (2010). 21. Century standards for information literacy. *Leadership, 39*(4), 20-22.

Gazi, Z. A. (2016). Tüm Eğitim Kademesinin Geleceği için Dijital Vatandaşlığın İçselleştirilmesi. *Eğitim ve Bilim, 41*(186).

Görmez, E. (2016). Öğretmen Adaylarının "Dijital Vatandaşlık ve Alt Boyutları" Hakkındaki Görüşleri (Bir Durum Çalışması). *Electronic Turkish Studies, 11*(21).

Hamutoğlu, N. B., & Ünal, Y. (2015). Digital citizenship in Turkey and in the world: Educational applications and technology. *The Online Journal of Quality in Higher Education, 2*(3), 39-43.

Hollandsworth, R., Donovan, J., & Welch, M. (2017). Digital citizenship: You can't go home again. *TechTrends, 61*(6), 524-530.

Isman, A., & Gungoren, O. C. (2013). Being digital citizen. *Procedia - Social and Behavioral Sciences, 106,* 551-556.

Kabataş, S. (2019). *Öğretmen Adaylarının Dijital Vatandaşlık Algılarının Yaşam Boyu Öğrenme Tutumları ve E-Öğrenmeye Hazır Bulunuşluğu Açısından Değerlendirilmesi* (master thesis). Bartın: Bartın Üniversitesi.

Karaduman, H. (2011). *6. sınıf Sosyal Bilgiler dersinde dijital vatandaşlığa dayalı etkinliklerin öğrencilerin dijital ortamdaki tutumlarına etkisi ve öğrenme öğretme sürecine yansımaları* (doctoral thesis). İstanbul: Marmara Üniversitesi.

Karaduman, H., & Öztürk, C. (2014). Sosyal Bilgiler Dersinde Dijital Vatandaşlığa Dayalı Etkinliklerin Öğrencilerin Dijital Vatandaşlık Tutumlarına Etkisi ve Dijital Vatandaşlık Anlayışlarına Yansımaları. *Journal of Social Studies Education Research, 5*(1), 38-78

Kaya, A., & Kaya, B. (2014). Teacher candidates' perceptions of digital citizenship. Öğretmen adaylarının dijital vatandaşlık algısı. *Journal of Human Sciences, 11*(2), 346-361.

Kocadağ, T. (2012). *Öğretmen Adaylarının Dijital Vatandaşlık Düzeylerinin Belirlenmesi* (Master thesis). İstanbul: Marmara Üniversitesi.

Mossberger, K., Tolbert, C. J., & McNeal, R. S. (2007). *Digital Citizenship: The Internet, Society, and Participation.* MIT Press.

Oyademi, T. T. D. (2012). *The partially digital: internet, citizenship, social inequalities, and digital citizenship in South Africa* (Doctoral thesis). Nigeria: Obafemı Awolowo University.

Özer, Ü. (2016). Sınıf Öğretmeni Adaylarının Dijital Vatandaşlığa İlişkin Görüşlerinin İncelenmesi. *V. Sakarya'da Eğitim Araştırmaları Kongresi,* 18.

Öztürk, M. (2015). *Ortaokul öğrencilerinin dijital vatandaşlık düzeyleri* (Master thesis). Kastamonu: Kastamonu Ünviersitesi.

Palfrey, J. G., & Gasser, U. (2011). Born digital: Understanding the first generation of digital natives. *ReadHowYouWant.*

Payne, J. L. (2016). *A Case Study of Teaching Digital Citizenship in Fifth Grade* (Doctoral dissertation). University of Alabama Libraries.

Porter, S. R. (2011). Do college student surveys have any validity? *The Review of Higher Education, 35*(1), 45-76.

Ribble, M., & Bailey, G. (2006). Digital citizenship at all grade levels. *Learning and Leading with Technology, 33*(6), 26.

Ribble, M., & Bailey, G. (2007). *Digital citizenship in schools.* Washington DC: The International Society for Technology in Education (ISTE).

Sakallı, H., & Çiftçi, S. (2016). Sınıf Öğretmeni Adaylarının Dijital Vatandaşlık Düzeyleri İle Siber Zorbalık Eğilimleri Arasındaki İlişkinin İncelenmesi. *Eğitim Teknolojisi Kuram ve Uygulama, 6*(2).

Takavarasha, S., Cilliers, L., & Chinyamurindi, W. (2018). Navigating the unbeaten track from digital literacy to digital citizenship: A case of university students in South Africa's Eastern Cape province. *Reading & Writing, 9*(1), 1-15.

Thomas, S. N. (2018). Promoting digital citizenship in first-year students: Framing information literacy as a tool to help peers. *College & Undergraduate Libraries, 25*(1), 52-64.

Torun, E. D. (2020). Educational Use of Social Media in Higher Education: Gender and Social Networking Sites as the Predictors of Consuming, Creating, and Sharing Content. *Acta Educationis Generalis, 10*(2), 112-132. https://doi.org/10.2478/atd-2020-0013

Vizenor, K. V. (2014). *Binary Lives: Digital Citizenship and Disability Participation in a User Content Created Virtual World. Buffalo.* State University of New York at Buffalo.

Vural, S. S., & Kurt, A. A. (2018). Üniversite Öğrencilerinin Bakış Açısıyla Dijital Vatandaşlık Göstergelerinin İncelenmesi. *Eğitim Teknolojisi Kuram ve Uygulama, 8*(1), 60-80.

Yalçınkaya, B., & Cibaroğlu, M. O. (2019). Dijital Vatandaşlık Algısının İncelenmesi: Ampirik Bir Değerlendirme. *Business & Management Studies: An International Journal, 7*(4), 1188-1208.