




## Levels of Digital Inequality and the Process of Adaptation to Digital Culture

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**Abstract:** Digital inequality refers to the differences in individuals' access to, use of and benefits from digital technologies. This study aims to explore the effects of demographic differences on digital cultural inclusion and exclusion. The study is designed using a sequential mixed model. The population of the study is consisted of individuals over the age of 18 living in the Sakarya province of Türkiye. The survey form was administered to collect data from 504 participants selected from the population by random sampling. Semi-structured interviews were carried out with 8 participants who are considered capable of providing detailed information on the subject. The survey form contained statements intended to measure the access and benefit levels of the participants. The usage frequency is discussed via questions prepared by the researcher based on the Likert scale, considering the sub-dimensions of digital citizenship introduced by Mike Ribble. According to the results, the participants' access to digital technologies is at high level. Concerning digital technology usage, differences are primarily determined on the basis of the age factor. With regard to the level of benefits, the satisfaction level increased as the education level increased and age decreased. Results obtained through interviews suggested that using digital technologies activated those involved in this digital culture, made their lives easier, and allowed them to engage in popular issues. Finally, the participants thought that the activities in the new media helped them engaging in current events and get important news to cope with recent events and discussions.

**Keywords:** Digital inequality, Digital divide, Digital technologies, Digital culture, Social exclusion

### 1. Introduction

Technological developments that arise in line with human needs affect the culture of society and are also affected by the culture in which they arise. Due to the emergence of the Internet as a form of mass communication and the widespread use of personal computers and other devices such as smartphones, digitalisation has had an impact on culture. Digital technologies have become widespread all over the world. As a result, the study of digital culture potentially covers all aspects of daily life (Gere, 2019, p. 16). Digital culture is the cultural structure that emerged as a result of technology becoming more and more present in our lives and changing our habits to align with the innovations and changes it creates today (Acar, 2018, p. 233). One of the main reasons why this is seen as a culture is that individuals have the chance to access the internet not only in their free time but also in all other periods when they are free and not working. Such intensive use of internet technologies and spending a lot of time on the internet cause changes in the cultural structure, communication style, family and friendship relations of individuals and societies.

Today, as digital technology is creating a new cultural environment and as this culture spreads to the offline environment, it has become increasingly inevitable to feel the transformations in all areas of life. It is believed that the new communication environments created by new media technology will not only foster the development of a distinct culture but will also lead to a new arena of social conflict (Atlı Şengül, 2023, p. 36). Government bodies and other established organizations rely exclusively on digital technology tools to monitor their operations for their specific needs. As a result, all kinds of information is now in digital form. Various operations and tasks, including social services, insurance, billing systems, leisure activities, bank transactions, education, legal transactions, and employment, can be conducted via digital media channels (Gere, 2019, p. 15). Many transactions of institutions and organizations that

need to be carried out electronically or access to services are related to the digital citizenship self-efficacy of individuals. Digital citizenship is defined as the capability to participate in the online society (Ribble, 2015). Nowadays, digital citizens use the internet to fulfil many daily activities. In a sense, digital citizens have incorporated the Internet into their daily life routines (Mossberger, Tolbert & McNeal, 2007, p. 12).

The e-government system, developed to serve electronic government applications, is an internet service where the public conducts transactions related to the public. E-government can be defined as the transfer of many transactions, services and services carried out by the state to the electronic platform using appropriate information technology (Emiroğlu, 2003). The e-government also requires individuals to be digital citizens. The fact that individuals who lack self-efficacy in digital citizenship experience digital inequality is one of the reasons for using Mike Ribble's conceptualization.

Given the rapid technological advancements and increasing demands, the issue of individual inequality becomes prominent. Within this framework, we observe all the situations and phenomena present in people's daily lives that are also manifesting in the digital realm. The state of inequality is also inserted into the new culture created by digitalisation. It can be argued that individuals' participation in digital culture correlates with their degree of digital inequality.

The digital divide refers to the inequality in individuals' access to, use of, and benefit from digital technologies. Digital inequality depends not only on technological factors but also on social and cultural conditions. Digital inequality is a dynamic phenomenon due to the proliferation of technological innovations. Therefore, it needs to be constantly redefined using appropriate indicators. Over time, the digital divide has evolved into a subject that is deliberated upon at various levels, with differing conceptualizations. This study offers a broad examination of discussions on digital inequality, spanning from the past to the present, encompassing theoretical frameworks as well as various analytical approaches. The present study, centred on digital culture, emphasizes the importance of addressing digital inequality.

The primary aim of this study is to investigate digital inequality comprehensively, considering demographic variables, and to delve into the implications of inclusion and exclusion within the new culture fostered by Information and Communication Technologies. (ICT). In this study, employing a sequential mixed model, quantitative methods were utilized to ascertain the levels of digital inequality among individuals aged 18 and above residing in Sakarya province. Additionally, qualitative methods were employed to gather data on digital culture.

## **2. Digital Culture**

The Internet can be defined as a global network system that connects multiple computers, which enables the storage and processing of information and easy access by people. This network consists of interconnected hardware and software systems. The internet, like many inventions, was born out of military and scientific needs. In the 1960s in the USA, studies were initiated to technically transfer the information from the central computer to another computer via a local network connection in order to ensure military communication in case of war. Thanks to the studies carried out in the research department of the US Department of Defense, the intended information transfer was realized. With this development, a military computer network called ARPA-NET (Advanced Research Projects Agency) was established in 1969. Before long, in 1972, this network system became a structure in which 40 computers were connected. By 1975, it had been opened for use for specific purposes. By 1982, the number of computers connected to ARPA-NET had increased considerably. The US government took action and established a new network called MILNET, which was to be used only for military purposes. In 1990, ARPA-NET was shut down after it was renamed the Internet. ARPA-NET is an undeniably important development in the development of the internet (Timisi, 2003, p. 123).

The internet connection to Türkiye was first made on April 12, 1993, at the Middle East Technical University (METU). The Internet provided through METU remained the only line available to the country for a long time. Later, Ege University in 1994, Bilkent and Boğaziçi Universities in 1995, and Istanbul Technical University in 1996 had access to the internet. From 1996 onwards, the Internet became widespread throughout the country and began to be used in public and private institutions as well as universities (Özgit & Çağiltay, 2018, p. 11).

The Web system, which is based on the internet, enables the use of mechanisms. The Web system has become a worldwide network with www (World Wide Web). It is a network that connects the Internet through computers, services and networks. The development process of web technology is divided into periods. These periods are used to illustrate the varying characteristics of the internet itself, the provider and the user. The development of the internet in successive years can be analysed in four eras. These eras are called Web 1.0, 2.0, 3.0 and Web 4.0. When the internet first became widespread in the early 1990s, it had characteristics similar to those of traditional media. Internet users were only readers in the early days. In other words, the Internet offers one-way communication to its users. Users could just benefit from whatever content Web site administrators produced and presented. The few Web sites were only used for reading content and downloading programs. (Van Der Vlist et al., 2007, p. 17). At this early stage, the internet was far from interactivity, and its content could not be interfered with. This stage, called Web 1.0, was developed by Tim Berners Lee, who developed the Hyper Text Markup Language (HTML) software language at the European Center for Nuclear Research (CERN) in 1989 and is considered the founder of the Web. Web 1.0 technology consisted of very simple pages compared to today's internet technology. The content, where two-way communication was not possible, was produced only by servers with technical knowledge. Therefore, Web 1.0 technology was like a television or radio, with a one-sided transmission.

Developed in 2005 by Tim O'Reilly, Web 2.0 has become a technology that enables interaction and offers a wide range of applications. In the Web 2.0 era, the Internet is a social network and a collaborative medium where users can read and write to the extent allowed on Internet platforms. Users are now able to generate content, provide feedback, and become active and interactive. (Anderson, 2007, p. 2). Users who were consumers in the Web 1.0 era started to generate content in the Web 2.0 era. Thus, it may as well be said that blogs, dictionaries and social networks, which have become a part of our lives today, are the result of Web 2.0 technology. As a result, Web 2.0 is literally a social revolution (Erbner et al., 2007, p. 560).

The Web 3.0 era is referred to as the "Semantic Web" by Sheth and Thirunarayan (2012) in their book *Semantics Empowered Web 3.0*. Web 3.0, also known as the semantic Web, allows the process of interpreting and making sense of the data on the internet to be performed by a computer. The text that exists in the Web 3.0 era can be sorted not only quantitatively but also semantically. Web 3.0 technology can make inferences from the Web sites used by individuals in the searches they make through search engines and, therefore can offer specific and effective results.

While Web 3.0 is the process in which data is interpreted and connections between them are established, Web 4.0 refers to the era of the Internet in which connections between minds are established. Web 4.0, also called the symbiotic Web, offers a powerful Web interface that enables mind control. In simpler terms, machines are clever in reading the contents of the Web and deciding what to execute first in order to load Web sites with high speed, high quality and high performance and to provide more interfaces (Aghaei, Nematbakhsh & Farsani, 2012, p. 8).

The technological development that led to the emergence of social media took place in the Web 2.0 era. The Web 1.0 era was characterized by one-sided communication and, therefore, a static environment, which soon led to the Web 2.0 era, in which users could also generate content. In other words, the Web 2.0 era was the most important factor in the formation of social media. Social media is also used as a

"social network" in both daily life and academic literature. There are many definitions of social media. Van Dijk (2018, p. 251) defines social media as internet applications that enable the sharing of things. These applications can be messages, photos, videos, music, information and knowledge networks and even games (online gaming). Social media is expanding its sphere of influence day by day, both with the emergence of new platforms and the increase in users. Considering data, people, organizations and many other things together, social platforms carry out important activities on the internet. These sites are used not only for communication, but also for e-commerce, marketing, education, media, cultural production, entertainment, health applications and political purposes (Castells, 2012, p. 200).

The process that covers the features and applications that emerged as a result of the processes in which computer and internet technologies have developed considerably and differed periodically in terms of their technical features constitutes what is termed as new media. These applications can be listed as social networks, message-based applications, blogs, wikis, video sharing sites, virtual worlds, voice-based media, news and information indexed networks. The transformative impact of new media in daily life is increasing day by day. This situation has led to the emergence of a distinct culture known as digital culture, contrasting with traditional cultural norms. Similar to the phenomenon of digital inequality, researchers also exhibit variations in their conceptualizations of digital culture. Castells (2001) describes this phenomenon as internet culture, Levy (2001) as cyber culture, Jones (1998) as virtual culture and Manovich (2001) as information culture.

To grasp the meaning of digital culture, it is essential to establish a definition of the broader concept of culture. Culture is considered among the most intricate words in the English language, ranking among the top two or three in complexity (Williams, 1983). In the early 1950s, North American anthropologists Kluchon and A.L. Kroeber identified 161 different definitions in their literature review on the definition of culture (Eriksen, 2019, p. 18). Certainly, addressing such a multitude of definitions here is not feasible. However, it should be mentioned that when the definitions are analysed, most of them basically have the same meaning. Recent definitions tend to distinguish between actual behaviours and the abstract world of values, beliefs and perceptions that underlie those behaviours. Then from a behavioural perspective, culture is "a society's shared and socially transmitted ideas, values, and perceptions, which are used to make sense of experience and which generate behavior and are reflected in that behavior" (Haviland et al., 2008, p. 103). Recently, it has been observed that the lives of individuals and societies in the digital sphere are also included in the discussions in the field of culture.

Digital culture encompasses the ways in which technology and the internet have revolutionized and altered the way humans interact. (Gere, 2019, p. 15). The foundations of digital culture have been laid through both computer technologies, mobile devices and the internet. One of the main reasons why this is seen as a culture is that individuals have the opportunity to access the internet not only in their free time but also throughout all other periods aside from work and leisure. Apart from being a phenomenon present in contemporary society, digital culture is also recognized for its secondary dimension, which involves the act of leaving a trace and storing all data through network engagement. (Özbaş Anbarlı, 2019, p. 78). Such intensive use of internet technologies and spending a lot of time on the internet cause changes in the cultural structure of societies, the communication style of individuals, and the interactions they have in family and friendship relationships.

The concept of digital culture has two different meanings, on the one hand, focusing on its wide-ranging impact on the lives of individuals and affecting the cultural structure, and on the other hand, focusing on all kinds of cultural products, from individual productions to works of art in the virtual environment (Koç, 2022, p. 509). Digital culture is not limited to the Internet or modern communication technologies. Mass media, television, radio, recorded music, and film are now produced digitally and increasingly distributed digitally. The conversion of these diverse media tools into digital formats has initiated the

development of a media ecosystem adaptable to various platforms like the Internet and video games. Similarly, individuals incorporate similar technologies into their daily professional endeavours.

### 3. Digital Inequality

Digital divide is a concept which was first used in an official document in 1999 in the report *Falling Through the Net: Defining the Digital Divide* by the National Telecommunications and Information Administration (NTIA) of the US Department of Commerce (NTIA, 1999). The related report covered discussions on income and education levels, while examining comparisons in computer ownership and internet usage among lower-income groups. In the NTIA report, digital divide was defined as the inequality between those with access to new technologies and those without and was recognized as one of the leading economic and human rights problems of the USA at that time (1999, p. xiii).

Later, the Organization for Economic Cooperation and Development (OECD) defined digital divide as the gap between individuals, households, business sectors and geographical areas which have different socio-economic levels in terms of opportunities to access both information and communication technologies (OECD, 2001, p. 5). Unlike NTIA and OECD definitions, Cullen (2001, p. 311) contends that the digital divide stems from historical, socio-economic, geographical, educational, generational disparities, or individual physical inadequacies. It does not seem possible to think of digital divide independently of social life.

For instance, Norris (2001) uses the concept of digital inequality to describe the gap in internet access among social classes all over the world. Furthermore, researchers studying on the digital divide have also emphasized the beneficial / non-beneficial aspect of inequality, rather than just those with or without access. For example, Rooksby, Weckert and Lucas (2002, p. 197) argue that digital divide occurs when only certain members of society have access to technology and the benefits it generates. Based on this argument, researchers point to the gap between people with high levels of access to ICT and others who have little or no access to it. Franda (2002, p. 11) contends that while the Internet hasn't caused impoverishment in any region, it has fuelled a widening gap between wealthy and impoverished parts of the world. Martinez-Garcia (2013, p.2) further develops this assertion by underscoring the significance of countries embracing new communication technologies. He argues that new communication technologies enhance development and productivity in order to provide wealth and create better living conditions for its citizens.

Wynn (2005) states that there are three reasons why digital divide within a group may persist. Firstly, poor economic conditions, secondly, the further advancement of technology may leave the poor even more disadvantaged. Thirdly, any form of disadvantage obstructs the access of these digitally divided groups to education and opportunities in the digital world. In socioeconomic terms, digital inequality is a way of conceptualising larger societal concerns than is necessary for the government and societal response to close the gap between the haves and have-nots.

Rye (2008) suggests that the digital divide persists as a result of disparities in access and the ongoing changes in access patterns with the advent of new digital technologies. This concept can be represented on a statistical scale, illustrating how individuals and social groups attain differing positions along an infinite continuum. This continuum consists of information transferred at the local and global level. Gibbs, Dosen and Guerro (2009, p. 16) assert that individuals who fail to access and utilise new technologies can become deprived of their social rights and may lack the capacity to contribute positively to their community.

Digital divide not only perpetuates and reinforces existing disparities but also creates new ones. As computer and internet technologies undergo constant change and transformation, the gaps they generate also diversify and grow more complex over time (Özsoy, 2020, p. 11). It is clear that current research on digital inequality tackles digital inequality at three levels. These are access, usage and



tangible outcome (Ragnedda & Ruiu 2017; van Deursen & Helsper, 2015). At the first level of digital divide, an assessment is made in terms of "access" depending on technological developments. As stated earlier, there was inequality between those who have/do not have digital technologies and those who have/do not have access to the internet. This has been called "first-level digital divide" or "access gap", which is considered as the first level of digital inequality (Scheerder, et al., 2017). In other words, the access gap refers to individuals' capacity to access the necessary ICT infrastructure and tools essential for participating in the digital sphere (Deursen & Helpster, 2015; Francis, et al., 2019). Adequate technological infrastructure and equipment are essential, and in addition, this access should be sustainable and of high quality (Tolu, 2019).

With the advent of ICT tools, the disparities individuals encountered in accessing these technologies and the underlying reasons for these gaps were examined within the realm of basic-level inequality, commonly known as first-level digital inequality. Due to the proliferation of technology and increasing access, researchers have realised that focusing only on the problem of access offers a limited perspective. Therefore, digital inequality research has started to focus on digital skills, purpose and autonomy of use as well as discussions of access problems. These studies are characterised as "second level digital inequality" or "use inequality" studies.

As digital inequality research progresses, it becomes evident that equal access does not necessarily guarantee equal utilization of the opportunities provided by ICT. The concept recently called the third-level digital divide pertains to the tangible advantages that result from utilizing ICT. The real and tangible benefits that individuals derive from internet use are externally observable social resources such as a better job, better salary, more information, and a larger and stronger social network. These are based on their previous offline history. Another background is their digital equity and interactions (Ragnedda, 2018).

These three tiers of digital inequality—access, usage, and tangible outcomes—illustrate and validate the intricate and multi-faceted nature of digital inequalities. It is necessary to examine not only the different dimensions but also the results of different types of digital inequality. Digital inequalities are interwoven with existing processes of social inequalities and cannot be clearly determined using a dichotomous approach (included versus excluded, or skilled versus unskilled). In order to tackle digital inequalities, it is imperative to confront social inequalities, as they are deeply intertwined and mutually reinforce each other (Ragnedda, 2020, pp. 49-50). In fact, digital inequalities are influenced by pre-existing disparities within the social sphere, including various socioeconomic backgrounds and forms of social stratification.

Considering these various interpretations, the digital divide emerges as a novel dimension of inequality shaped by demographic factors, influencing and being influenced by daily life. It denotes a failure to engage with the new experiences and cultures fostered by ICT, rooted in real-life contexts and impacting real-life outcomes.

#### **4. Methods**

This study adopts a "sequential mixed" model. In studies using the sequential model; quantitative methods are used at one stage of the study, and qualitative methods are used at another. To apply the sequential model, data collection begins with either a quantitative or qualitative approach, followed by employing the other approach for data collection and as a final step, the data acquired through both methods are merged and interpreted (Barnes, 2019, p. 310). In this research, the quantitative method was used first. Afterwards, semi-structured interviews were carried out with people selected from the participants surveyed via a questionnaire. Before starting to conduct this study, Ethics Committee Approval was obtained regarding the suitability of the scales and forms to be used in the research. The letter dated 10.26.2021, protocol number 175261, together with the Meeting and Decision Minutes of

the Anadolu University Social and Human Sciences Scientific Research and Publication Ethics Committee of the Republic of Türkiye, unanimously decided that all forms to be applied were appropriate in terms of publication ethics and scientific research.

We employed both methods concurrently because of our concern that relying solely on the quantitative approach might yield insufficient data to address the research questions adequately. In other words, the qualitative method was employed to elucidate the participants' engagement in digital culture and its correlation with the digital divide. Within this framework, the research aims to address the following questions:

- 1- What is the situation in digital inequalities (access, usage and benefits) across various segments of the population studied?
- 2- What are the effects or implications of demographic differences on digital divide?
- 3- How does digital inequality affect the dimensions of digital culture attitude?
- 4- What does it mean for people to be included in or excluded from the new culture created by ICTs?
- 5- What differences are observed in the digital culture of those in the top and bottom deciles of inequality?

#### **4.1. Quantitative study**

##### **4.1.1. Sample**

The study population comprises individuals aged 18 and above who reside in the province of Sakarya, Türkiye. The cultural heterogeneity of Sakarya serves as a primary criterion for selecting our population from the residents of this province. Rural and urban comparisons are conducted within the study. There are 16 districts in Sakarya in total. While Adapazarı, Erenler and Serdivan constitute the central districts of Sakarya, Arifiye, Akyazı, Sapanca, Kaynarca, Karasu, Karapürçek, Kocaali, Hendek, Söğütlü, Ferizli, Geyve, Pamukova and Taraklı are the peripheral districts. When selecting our sample, we considered the proportional representation of the population residing in both the urban centre and the rural periphery of the province. Throughout the sample selection process, individuals from both central and peripheral districts were incorporated into the study. The objective is to alleviate concerns about inconsistent findings in the rural-urban comparison, given the presence of rural populations residing both within and outside the urban centre. Random sampling was used to select our sample. It is a technique which ensures that every individual in the population has an equal chance of being selected for the sample. First, a list of all individuals in the universe is created. Once the characteristics of the population are thoroughly examined, the suitable sample size is determined. Then, by using the lottery method or the table of random numbers, random sampling is carried out so that a single individual is taken from the universe each time (Ural, 2011, p. 37).

In this study, the sample size was determined by considering both the overall population of Sakarya province and its district populations. Additionally, the demographic characteristics of the individuals to be sampled were taken into account in proportion to the population of the districts. It was subsequently checked whether the sample was representative of the population. The total population of Sakarya is approximately 1 million and 60 thousand. Since the research targeted individuals aged 18 and above, the sampling was drawn from this specific demographic group, which totalled a population of 755 thousand individuals. Yazıcıoğlu and Erdoğan (2004) state that the figure 384 corresponds to the universe or sample size needed for a population of 100 million with a confidence interval of 0.05. Consequently, it was considered appropriate to analyse the data collected from 504 individuals out of a population of 755 thousand.

#### **4.1.2. Data collection instruments**

The questionnaire conducted in the research has four parts. The first part includes statements concerning personal information about the participants. In the second part are statements to determine the participants' levels of access to digital technologies. In the third part, the statements for identifying the participants' use of digital technologies were formed in a way to cover the eight factors identified by Ribble (2015) for digital citizenship. These factors consist of the elements of digital communication (5), digital access (5), digital health (5), digital literacy (4), digital law (3), digital rights and responsibilities (3), digital etiquette and digital security (13), and digital commerce (2). The 40 statements determined to cover these elements were included in the scale after the approval of experts on the subject. A 5-point Likert scale was used for the participants to respond to the statements in the scale. The final section of the questionnaire contains statements aimed at assessing participants' satisfaction with digital technologies.

Once the scale items were inputted into SPSS, the Cronbach's Alpha test was conducted as the initial step. The test revealed that the Cronbach Alpha coefficient value for the 40 statements in the scale was .901. A Cronbach Alpha value between 0.80-1.00 means that the scale has high reliability, between .60-.80 indicates sufficient reliability, and between .40-.60 indicates low reliability. If the Cronbach Alpha coefficient value is lower than .40, the scale is not reliable (Özdamar, 2004, p. 632). The obtained value indicates that the scale exhibits high reliability. Following the reliability test, the correlation of each statement with the total score was checked. For this, Corrected Item Total Correlation values were examined. Each statement scoring above .30 indicates that the values yielded a consistent measurement of the same thing. In conclusion, removing any statement from the scale does not compromise its internal consistency.

#### **4.1.3. Data analysis**

In the quantitative segment of the study, we conducted the Cronbach Alpha test and factor analysis to assess the validity and reliability of our scales, determine the adequacy of the sample size, and finalize the dimensions within the scale. Then, frequency analyses were performed to obtain the descriptive information of the participants and to determine to what extent the participants agreed with the statements in the scale. Chi-square analysis was employed to identify differences between the variables, and Independent-Sample t-test and One-Way ANOVA Test were carried out to assess whether participants' agreement with the scale's dimensions varied based on their demographic characteristics. The data obtained via semi-structured interviews are analysed using the MAXQDA program.

#### **4.1.4. Procedures**

Once the research questionnaire was finalised, it was distributed to participants residing in 16 districts within Sakarya province. Following the calculation of population density for each district, the questionnaire was administered in each district in accordance with its respective population density. For this purpose, 504 was determined as the sample number of the research. A face-to-face questionnaire was administered to 504 people living in Sakarya province and its districts in approximately three months. Upon verifying the appropriateness of the gathered questionnaires, it was determined that all of them were suitable for analysis, resulting in the inclusion of 504 survey forms in the study. Semi-structured interviews were carried out as the data collection method for the qualitative section of the research. As it is known, in semi-structured interviews, the researcher prepares the research questions in advance. On the other hand, the researcher has the option to interject during the interview process by posing additional secondary or follow-up questions to the participant. This can be done seamlessly without interrupting the natural flow of the interview, encouraging the participant to expand on their responses. If the respondent provided answers to certain questions while addressing other questions during the interview, the researcher may opt not to ask those particular questions again.



## 4.2. Qualitative study

For the qualitative part of the study, semi-structured interviews served as the method of data collection. The interview participants were chosen from among those who had taken part in the quantitative phase of the research.

### 4.2.1. Participants

Eight people were interviewed in total. The interview participants were selected from those who had filled out the questionnaire. The gender distribution of the interview participants is equal. As for the district diversity among the participants, 3 were from Serdivan, 2 from Adapazarı, 1 from Kocaali, 1 from Erenler, and 1 from Hendek. Utmost attention was paid to ensure that the other demographic characteristics of the participants were also different. During the participant selection process for the interview, variations such as their extensive engagement with digital technologies, perceptions of competence/incompetence, and willingness to offer in-depth information on the subject were considered.

### 4.2.2. Interview form

The semi-structured interview questions were crafted by expanding upon the inquiries found in the questionnaire utilized in the quantitative method. The interview form consists of four sections. In the first one, the participants were assessed regarding their concerns and expectations regarding access to and utilization of digital technologies. In the second section, questions were posed to the participants about the strengths and weaknesses they felt in their use of digital technologies compared to the individuals around them. In the third section, questions were asked about the benefits of digital technologies and the Internet. Finally, the aim was to elucidate what digital culture inclusion and exclusion meant to the participants.

## 5. Findings

### 5.1. Quantitative findings

Upon evaluating participants' access to smartphones, personal computers, mobile internet, and WI-FI based on their district of residence, it was discovered that there were no significant discrepancies between the districts. In general, the overall access level among participants in Sakarya was notably high. The results of our findings about the access of the participants in all districts are given in Table 1.

**Table 1**

*General Situation in Sakarya Province in Terms of Access*

City	Smartphone		Personal Computer		Mobile Internet		WI-FI	
	Yes	No	Yes	No	Yes	No	Yes	No
Adapazarı	134	2	86	50	131	5	116	20
Akyazı	45	0	25	20	44	1	41	4
Arifiye	19	1	5	15	20	0	20	0
Erenler	41	4	27	18	41	4	41	4
Ferizli	15	0	3	12	15	0	12	3
Geyve	25	0	14	11	25	0	23	2
Hendek	40	0	27	13	40	0	37	3
Karapürçek	6	0	2	4	0	6	5	1
Karasu	30	0	10	20	28	2	29	1
Kaynarca	12	0	9	3	8	4	11	1
Kocaali	11	1	6	6	12	0	10	2
Pamukova	14	1	6	9	15	0	15	0
Sapanca	20	0	8	12	18	2	18	2

Serdivan	71	0	44	27	70	1	63	8
Söğütlü	6	0	4	2	6	0	6	0
Taraklı	6	0	2	4	6	0	6	0
Total	495	9	272	232	485	19	453	51

Upon analysing the access level in Sakarya province by age, it becomes evident that 100 % of the individuals in between 18-24 age, representing the youngest age group, possess a smartphone, 66% have a personal computer, 95.9% use mobile internet, and 95.9% use WI-FI. 77.3% of individuals aged 61 and over, which is the oldest age group, have a smartphone, 13.6% have a personal computer, 77.3% have mobile internet, and 54.5% have WI-FI. The distribution of access by age is shown in Table 2.

**Table 2**

*Access Distribution by Age*

Age	Smartphone		Personal Computer		Mobile Internet		Wi-Fi	
	Yes	No	Yes	No	Yes	No	Yes	No
18-24	147	0	97	50	141	6	141	6
25-35	139	0	85	54	138	1	119	20
36-45	129	1	67	63	125	5	120	10
46-60	63	3	24	42	64	2	61	5
60+	5	17	3	19	5	17	12	10
Total	483	21	276	228	485	19	453	51

### 5.1.2. Usage

The participants' skills in using digital technologies were formed to cover the eight dimensions of digital citizenship identified by Ribble (2015). These elements are digital communication, digital access, digital health, digital literacy, digital law, digital rights and responsibilities, digital etiquette and digital security, and digital commerce. These dimensions were identified according to the participants' gender, age, occupation, education and income status.

The study revealed significant differences in participant behaviour regarding digital etiquette and security, digital health, and digital law based on gender ( $p < .0001$ ). Specifically, women exhibited greater engagement in these dimensions compared to men. Men outperformed women only in digital commerce. Regarding the usage behaviours regarding digital communication ( $p=.938$ ), digital access ( $p=.826$ ), digital rights and responsibilities ( $p=.081$ ), and finally, digital literacy ( $p=.761$ ), it was determined that there was no significant difference between males and females.

Significant differences were noted when participants' usage across eight sub-dimensions based on age was analysed ( $p < .0001$ ). Overall, it was observed that usage skills declined with increasing age. Specifically, individuals aged 61 and above, representing the oldest age group, exhibited lower usage skills compared to other age brackets.

Evaluating the participants' usage across eight sub-dimensions based on their professions pointed to significant differences ( $p < .0001$ ). Overall, it was evident that teachers and academicians exhibited superior usage skills compared to individuals in other professions.

When the participants' use of digital technology was evaluated based on their income, it was determined that individuals with higher income displayed higher activity levels in the use of digital communication, digital law and digital literacy.

### 5.1.3. Benefits

Independent sample t-test and ANOVA were conducted to determine whether participants' satisfaction levels with digital technology use varied depending on their demographic characteristics. An

Independent sample t-test was used to investigate the differences among factors consisting of two variables, such as gender, and an ANOVA test was carried out so as to determine the differences for factors consisting of more than two variables (Coşkun et al., 2017, p. 200).

**Table 3***Satisfaction Levels of the Participants*

	1	2	3	4	5
	f	f	f	f	f
	%	%	%	%	%
How would you describe the level of satisfaction you get from the use of digital technologies?	36	47	218	146	57
	%7,1	%9,3	%43,3	%29	%11,3
How would you describe the level of satisfaction you get from the use of digital technologies influencing your work/education life?	47	74	117	149	57
	%9,3	%14,7	%35,1	%29,6	%11,3
How would you describe the level of satisfaction you get from using digital technologies that affects your life satisfaction?	52	81	207	129	35
	%10,3	%16,1	%41,1	%25,6	%6,9

\*1=Very low, 2=Low, 3=Medium, 4=High, 5=Very High

As can be seen in Table 3, the participants' positive satisfaction with digital technologies is high. One could argue that the increased accessibility of digital technologies today directly influences the satisfaction levels of the participants. In addition, digital technologies have a very important place in business/educational life. Understandably, the participants' use of digital technologies significantly affects their work/education life. Finally, as for the effect of digital technologies on the participants' life satisfaction, it is observed that the majority of them are undecided on this issue.

**Table 4***Factors Positively Affecting Level of Satisfaction with the Use of Digital Technologies*

What are the most important factors that positively affect or increase the satisfaction you get from the use of digital technologies?	Yes		No	
	N	%	N	%
Have a smartphone	392	77,8	112	22,2
Having sufficient internet skills	213	42,3	291	57,7
The prevalence of mobile applications	228	45,2	276	54,8
Good infrastructure in the city I live in	72	14,3	432	85,7
Internet access speed	160	31,7	344	68,3
Other	25	5	479	95

A notable 77.8% of participants affirm that owning a smartphone positively impacts their attainment of a desirable level of satisfaction with digital technology use ; 42.3% state that this was due to their high internet usage skills; 45.2% state that it is affected by the prevalence of mobile applications; 14.3% state that it was due to the good internet infrastructure in the city where they live; 31.7% explain their desirable level of satisfaction by the fact that the speed of internet access was high; and 5% state that other factors were involved. Considering the findings, it is observed that the most important factor affecting the satisfaction obtained from digital technologies is smartphone ownership. Apart from smartphone ownership, the other factors that positively affect satisfaction are listed as follows: the prevalence of mobile applications, high internet usage skills and internet access speed.

**Table 5***Factors Negatively Affecting Satisfaction with The Use of Digital Technologies*

	Yes		No	
	N	%	N	%
Poor internet infrastructure	221	43,8	283	56,2
Insufficient usage skills	119	23,6	285	76,4
High cost	227	45	227	55
Not enough mobile apps	31	6,2	473	93,8
Fear of being watched/recorded	146	29	358	71
Other	51	10,1	453	89,9

Regarding the factors that unfavourably impact satisfaction with digital technology use at the desired level, 43.8% of the participants attributed it to inadequate infrastructure; 23.6% stated that it was because of their inadequate proficiency in usage; 45% stated that it was high cost; 6.2% stated that it was because of the limited availability of mobile applications; 29% stated that it was the user's concern about being tracked and recorded; and 10.1% stated that other factors were involved. The findings indicate that the most important factor that negatively affected the satisfaction obtained from digital technologies was high cost. Apart from the high cost factor, the participants mentioned the following rank of importance for the other factors: that the infrastructure was not good, that they were worried about being tracked/recorded and that there were not enough mobile applications.

## 5.2. Qualitative findings

The third question posed to the participants required their views on the benefits from digital technology. First of all, concerning the benefits from the use of digital technology, there are explanations that it contributes to their profession and saves time.

In the interview, questions were posed about their views on the concept of digital culture. First, the interviewees were asked what digital culture means. Some answers provided are as follows:

P1: "I guess digital culture is the way people behave and act on Facebook, Instagram, etc."

P2: "What we mean by digital culture, I think, is living in a state of digital dependency. I mean our perception of time and space undergo transformation and change. For instance, there is now something called home office working, which is independent of space, so this home office working style is also independent of time. That is, you can work at flexible hours"

P5: "... I would describe digital technology as its users' states, movements, attitudes and behaviours which they unconsciously create among themselves."

P7: "When I heard this concept, I thought of the traditions we have transferred from the past to the present, so I can say that it is the accumulation of technological innovations that have been passed down from the past to the present and that continues to increase. I can also say that digital culture is adapting to the world transformed by technology."

In the last interview question, the participants were asked to explain what digital culture inclusion and exclusion meant, which was also one of the main research problems. This question was posed with the aim of obtaining anthropological data from the participants. The responses supplied by the participants are given below:

P1: "Well, I don't know if I belong to this culture or not, but I have it all - phone, computer, tablet. My house has Wi-Fi, and my phone has an unlimited internet package. Facebook, Tiktok, Instagram - I am always on these. The town we live in is a small place where everyone knows each

other. I make and share a video on TikTok. Then the next day, when I go out, I get reactions like "your video is very good." I like this, frankly. It seems like it has made me an even more active person. Now I am constantly thinking about what I can share that will get a lot of likes."

P2: "I have to make use of digital technologies in areas I think to be useful. And in areas which I find useless, I try to stay out of the influence of digital culture. This staying out can be a disadvantage, such as being unaware of a new popular music release or a new movie. This can lead me to lose track of daily new developments."

P4: "I never neglect my work and never have. I'm not into these things (i.e. social media). Nor have I felt anything missing from my life without them."

P5: "For example, baby showers, gender reveal parties, baby's first tooth celebrations, events such as henna nights and many other lavish and costly events that are purely for show have entered our lives with digital technology and have almost become traditional practices. Both financially well-off and those who do not feel things like this have to do so. I think that people who try to create the perception that they are happy, wealthy and beautiful by sharing on social media such events, videos or beautiful photos with filters are not actually like that in real life. Therefore, I try to keep myself out of this culture as best I can."

P7: "...When I join this culture, I feel as if I have acquired 21st century skills and adapted to the modern age. If I were not part of the digital culture, I would not know what is going on around me or in the world; then it would be a pity not to find out about the latest diseases, world crises, new technological gadgets, and technological products that make life easier."

## 6. Results

The access level of the majority of the participants living in Sakarya province is quite high (smartphone 98%, mobile internet 96%, Wi-Fi 90%). Likewise, when district, gender, education and income status were taken into account, it was found that the access level of the participants was high for all the variables. Within the scope of the Household Information Technologies Survey conducted regularly every year by TURKSTAT (Turkish Statistical Institute), the Internet usage rate in the Eastern Marmara region, according to the statistical regional classification level 1, which includes Sakarya province, is 93.7% (TURKSTAT, 2021). In a study conducted in Konya, a different city in Türkiye with an urban and rural population, Akğün (2020, p. 95) found that the participants did not have problems accessing ICT tools such as smartphones and the Internet.

The study determined that the participants exhibited a high degree of digital communication behaviours. It is seen that individuals who have access to digital technologies also have high levels of digital communication behaviours. In today's circumstances, access to digital technologies is imperative. Sütüoğlu (2020, p. 298) cites the following words spoken by a 39-year-old father about access to digital technologies in the findings of his research: "They used to tell me: 'One should buy white goods, a sofa set, a car, a house!', but now they say: 'One should have a cell phone, a computer and internet at home!'. These words actually reveal that access to digital technologies is seen as a basic necessity for life.

The participants have high levels of digital health behaviours. The analysis of these behaviours of the participants based on demographic characteristics demonstrated that those in the lower age bracket had higher levels of digital access behaviours than those in the upper age group, and those with a higher education level had higher levels of digital access behaviours compared to those with a lower education level. Akğün (2020, p. 95), in his research on the E-Nabız (E-Pulse) system and digital health, found that the education variable is effective in using the E-pulse system. He also asserts that education plays a significant role in experiencing digital inequality in healthcare services, noting that individuals with higher levels of education have an advantage.



Participants' digital literacy behaviours are at quite a high level. Baran et al., (2017, p. 13) emphasize in their study that one of the biggest factors affecting digital inequality is digital literacy. They found that the lack of digital technology proficiency among older individuals significantly increases the digital divide. Similarly, the digital literacy level of elderly individuals in this study is also low. At this very point, Baran et al., (2017, p. 13) draw attention to the reasons why older individuals have difficulty in using digital technologies. In his research, Milward (2003) states that the unequal digital technology use among older individuals is rooted in the idea that digital technologies are primarily for young people, coupled with their apprehension about their ability to learn such technologies.

The results show that the participants have a high level of digital law behaviour. It is also observed that individuals do not ignore illegal situations that occur, especially in new media spheres. At the same time, the participants' strong adherence to digital laws suggests they avoid illegal websites and abstain from sharing posts lacking copyright protection.

The participants' behaviours concerning digital rights and responsibilities are at high levels. This means that these individuals are aware of their digital rights and responsibilities and do not remain unresponsive, especially in cases of cyberbullying and cyber harassment. The levels of the participants' digital etiquette and security behaviours are also high. It is seen that the participants are careful about ethical violations while using digital technologies. They respect the privacy of private life when making a post, get permission from other people in their sphere of influence when making a post, and cite sources.

The level of the digital commerce behaviour of the respondents is quite high. It is seen that individuals frequently carry out buying and selling transactions using digital technologies. In particular, it is seen that men sell things using cryptocurrencies and women sell using digital platforms.

The level of satisfaction that the participants get from using digital technologies is moderate. The level of satisfaction obtained depends on age groups. The satisfaction level of those in the lower age bracket is higher than that in the upper age group. It is observed that in terms of education, lower levels result in less satisfaction compared to higher education levels.

It is observed that the satisfaction level derived by participants from using digital technologies, which impacts their work/educational life, falls within moderate levels. The impact of participants' satisfaction with digital technology use on their work/educational life is diverse across age groups. The level of this influence for those in the lower age group is higher than that for those in the upper age group. In terms of professional comparison, it was found that the impact of digital technology use on the satisfaction of academicians generally indicates higher levels compared to other professional groups. In particular, individuals who use digital technology for all or part of their profession are more satisfied with digital technologies. The decrease in the satisfaction obtained from digital technologies, especially as the age of individuals increases, results from the fact that they either retire from their education and professional lives or reach a certain level of satisfaction.

In the last question, the participants were asked about the level of impact of the satisfaction that they obtained from the use of digital technology on their life satisfaction. It appears that the effect of participants' satisfaction with digital technologies on their overall life satisfaction is low. The extent to which satisfaction derived from digital technology use influences life satisfaction varies across age groups. The level of this influence for those in the lower age group is higher than that for those in the upper age group. Şahin and Yıldırım (2019, p. 104), in their research on the relationship between internet use and life of elderly individuals, point to a relationship between the number of people regularly contacted via the internet and life satisfaction. In other words, they emphasize that the presence and number of people contacted via the Internet increases life satisfaction and diminishes feelings of hopelessness among individuals.

The primary factor that enhances participants' satisfaction with digital technology use is their possession of a smartphone. As for the other factors that affect satisfaction levels positively, the participants state the prevalence of mobile applications, high internet usage skills, internet access speed and good internet infrastructure in their city, respectively.

Participants stated that the factors that negatively affect their satisfaction with the use of digital technologies at the desired level could be listed in the order of importance as follows: high cost, lack of good internet infrastructure, concern about being tracked/recorded, insufficient usage skills, and lack of mobile applications. It was determined that the major factor that negatively affected the participants' satisfaction was high cost.

Thirdly, the participants were asked about their opinions about the benefits they gained from digital technologies. First of all, regarding the benefits derived from digital technology use, they mentioned that it contributed to their profession and saved them time.

The participants were asked about their views on the use of digital technology. In this way, it was aimed to compare the data collected with the Likert scale with the answers supplied for the open-ended questions. Three open-ended questions were posed to the participants. In the first question, they were asked if they felt inadequate towards the people around them in their use of digital technology. Five of the eight interviewees stated that they felt inadequate towards the people around them. They attributed the reason for this inadequacy to their lack of proper interest.

In the second question of this section, participants were asked about their strengths and weaknesses in using digital technology. Considering the strengths of the participants, there are assertions indicating their proficient use of digital technologies for research purposes, their non-addiction to screens, and their swift adaptation to evolving technology. About their weaknesses, they state that they have difficulty in solving technical problems that arise, that digital technology is distracting and that it causes them to spend too much time.

The interviewees were asked how the use of digital technology affects their daily lives – either positively or negatively. The vast majority consider their ability to provide news as a positive aspect of digital technologies. Another positive aspect is that they eliminate distances. Participants stated that the factors that negatively affect their lives in the use of digital technologies are that there is too much unqualified information in digital technologies and that prolonged exposure to digital technologies makes them feel unhappy and inadequate. Participants see the time factor as both positive and negative.

First, the interviewees were asked what digital culture means. In line with the statements of the participants regarding what digital culture means, opinions range from those about people's behaviour and movements on social media, becoming addicted to digitalization, to adapting to the world changed by technology. The last question of the interview was to determine what digital culture inclusion and exclusion meant for them, which is one of the main problems of the research. During the interview, they emphasized that digital technologies made them more active when they were involved in digital culture, that they kept up with technological developments that made life easier through digital technologies, that they worried about a failure to be included in what was popular when they did not use digital technologies, that they thought of the activities emerging with new media as an action that they also had to do, and finally that they experienced a sense of incompetence in getting news when they did not use digital technologies. It is possible to say that these statements of the participants are an example of Fear of Missing Out (FoMO). FoMO can be defined as the fear of missing out on what is happening in other people's lives or what is going on. (Tanhan et al., 2022, p. 75).

## **7. Recommendations**

One limitation of this study is that it was carried out in a certain region within a certain time period. For this reason, future research could be conducted in a wider region, in a wider time period and in a way

that covers different cultures, and the results could be compared with those of the existing studies. Another suggestion is concerned with the research population. This research was conducted not on a specific sample population but on all segments of the society. According to the findings of the research, cultural differences between generations affect the digital divide. Future research could be conducted on a specific generation or a specific cultural segment, and digital inequality could be explored in depth for such groups.

In the present day, technology undergoes rapid development. Almost daily, the market sees the introduction of new technological gadgets or applications. Future research could examine the differences in digital inequality for these technologies by conducting studies about these new technologies and applications. Through the analysis of disparities, recommendations and critiques could be formulated for technological innovations to mitigate digital inequality.

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