

2023

# Digital Literacy Research

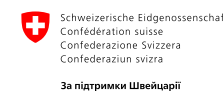
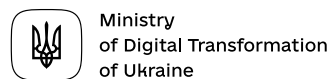
Ukraine



Ministry  
of Digital Transformation  
of Ukraine

## Report on the findings of the 2023 national public opinion poll

The study of digital skills of Ukrainians in 2019, 2021 and 2023 was conducted within the framework of the EGAP programme with the support of the Eastern Europe Foundation and the Innovabridge Foundation in partnership with the Ministry of Digital Transformation of Ukraine. The third wave of study aims to track the dynamics in the development of digital skills of the population of Ukraine and analyze the impact of the socioeconomic situation on the level of digital security. Structural indicator questions that were part of the comprehensive study enable multi-year comparisons.







«High level of digital skills among citizens stimulates development of digital economy, including the development of IT, digital marketing and other areas the entail modern technologies. According to the survey, 81% Ukrainians believe that development of digital literacy will have a positive impact on Ukraine's economy. Interest and ability to work in a digital space will contribute to innovation and competitiveness of the country»

**Mykhailo Fedorov**

Deputy Prime Minister of Ukraine for Innovation, Development of Education, Science and Technology – Minister of Digital Transformation



«Ukraine is already called the European tiger of digitization. The credit is to the digital solutions implemented by the Ministry of Digital Transformation together with the partners. However, technology is worthless if people don't use it. Now Ukrainians of all ages receive online services, pay utility bills, watch educational series and even donate. The progress of digital skills in recent times is significant. Regular research helps us speed it up»

**Viktor Liakh**

President of East Europe Foundation



«One of the pre-conditions for our integration into the EU is the digitization of state processes. However, this is not possible without citizens who have digital skills and are ready to receive services online. That is why we launched Diia.Osvita platform – the first large-scale project in Ukraine aimed at improving digital literacy of Ukrainians. According to the findings of this year's study, the number of adults with below basic digital skills has increased by 12.6% compared to 2019 and is now 40.4%. Also, the percentage of population with no digital skills has halved compared to 2019 to 7.2%»

**Valeriya Ionan**

Deputy Minister of Digital Transformation for European Integration



«In addition to steady dynamic development of digital literacy in the country, we observe the improvement of digital skills in various population groups. More than a half of the adult population of Ukraine report positive changes in their digital skills. Among young respondents, 3 in 4 say so. While the improvement of digital skills coincides with the COVID pandemic period, now, after the beginning of the full-scale invasion of the Russian Federation into Ukraine, we observe how these skills take root and get stronger. Now the most urgent challenge is not how many Ukrainians have digital skills, but how strong these skills are and how quickly they are being improved»

**Nadiia Kuzmycheva**

CEO of MLS Group

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# Abbreviations

AI	Artificial Intelligence
DESI	Digital Economy and Society Index
DSI	Digital Skills Indicator
f	female
FGD	Focus group discussion
ICT	Information and communication technologies
IDP	Internally displaced person
IOM	International Organization for Migration
m	male
MDT	Ministry of Digital Transformation
MIS	Medical information system
MOE	Municipally owned enterprise
TA	Target audience
TsNAP	Centre for Administrative Service Provision
USD	Ukrainian Society of the Deaf
AI	Artificial Intelligence



Adult Population



Adolescents



Population with Hearing Impairments



Focus Groups quotes







# Methodology

## Methodological framework for measuring digital literacy.

The framework for measuring the level of digital skills of Ukrainian population is the methodology of the European Commission for calculating the Digital Economy and Society Index [DESI], namely the Digital Skills Indicator [DSI, 2017 methodology], which is based on the Digital Competence Framework.

According to this framework, digital skills proficiency contains four areas of competence:

-  Information skills;
-  Communication skills;
-  Problem solving skills;
-  Software skills for content manipulation.

During the study, data is collected on operations and tasks performed by respondents during the last 3 months. It is assumed that persons who performed certain operations from the proposed list have the appropriate skills. According to the variety or complexity of the operations performed, three levels of digital skills are measured for each of the four dimensions:

No skills

Basic skills








Above basic skills

Based on the levels in each competence area, the overall level of digital skills of the population is measured. For a better understanding of the approach to measurement, we briefly present each area of competence.

## Information skills

**Definition within digital competence:** identify, locate, retrieve, store, organize, and analyze digital information based on its relevance and purpose.

### Operations used to measure information skills:

-  reading online news websites, magazines, newspapers;
-  search for information not related to work – for example, related to health (injuries, diseases, nutrition, recovery, etc.), recipes, raising children, etc.;
-  search for information about goods and services;
-  retrieving information from websites or applications;
-  uploading/printing of official forms;
-  submission of completed forms on the Internet;
-  copying and/or moving files / folders.

### Levels of information skills:

1

**No skills**  
did not use any of  
the skills in the last  
3 months

2

**Basic skills**  
used one skill in  
the last 3 months

3

**Above basic skills**  
used more than one skill  
in the past 3 months

## Communication skills

**Definitions within digital competence:** communicate in digital environments, share resources using online tools, connect with others and collaborate using digital tools, interact and participate in communities and networks.



### Operations used to measure information skills:

- 📧 sending / receiving e-mails;
- 📞 making calls (including video calls) via the Internet, for example, via Skype, Messenger, WhatsApp, Facetime, Viber, Telegram, Signal , etc.;
- 💬 using instant messages – that is, exchanging messages, for example, via Skype, Messenger, WhatsApp, Viber, Telegram, Signal , etc.;
- 👤 being present in social networks (creating a user profile, posting on Facebook, Twitter, Instagram, TikTok , etc.);
- 📝 posting / sharing messages on social and/or political topics (for example, in blogs, social networks);
- 🗳️ participating in online consultations or voting on certain social or political topics (for example, signing a petition, voting on public budget projects, participating in electronic consultations);
- 📤 uploading independently created material (content) – text, photos, music, video, software, etc. to any website where it can be shared or downloaded from.

### Levels of information skills:

- |  |  |  |
|--|--|--|
| <b>1</b>   | <b>2</b>   | <b>3</b>   |
| <b>No skills</b><br>did not use any of the skills in the last 3 months | <b>Basic skills</b><br>used one skill in the last 3 months | <b>Above basic skills</b><br>used more than one skill in the last 3 months |

### Problem solving skills

**Definition within digital competence:** identify digital needs and resources, make informed decisions about which digital tools are most appropriate for a purpose or how to solve conceptual problems using digital means, use technology creatively, solve technical problems, develop own and other people's competences.

### Operations used to measure problem solving skills:

#### List A – Problem solving:

- 📧 looking for a job or sending your resume;
- 🔍 searching for information about work;
- 📁 transferring files between computers / laptops or other devices (for example, using a flash drive);
- 📦 installation of software or applications;
- 🔒 changing security settings on any software (including the operating system).

#### List B – Awareness of online services:

- 📧 buying/selling goods or services via the Internet;
- 🏦 internet banking (payment of utilities, mobile phone, money transfer from card to card, etc.);
- 🎓 taking online courses (in particular, the recordings);
- 📚 using educational material on the Internet other than the full online course (for example, audio-visual materials, educational software, electronic tools, etc.);
- 🗣️ communication with teachers or students using educational websites/portals.

### Levels of information skills:

- |  |   |   |
|--|---|---|
| <b>1</b>   | <b>2</b>  | <b>3</b>  |
| <b>No skills</b><br>did not use any of the skills in the last 3 months | <b>Basic skills</b><br>performed one or more operations only from list A or from list B | <b>Above basic skills</b><br>performed at least one operation from list A and from list B |

## Software skills for content manipulation

**Definition within digital competence:** create and edit new content (processing words, images and videos); ability to integrate and process previous knowledge and content; generate creative expressions, media and programming; deal with and enforce intellectual property rights and licenses.

### Operations used to measure problem solving skills:

#### List A:

- using software for working with texts (for example, Word);
- using software for working with data (for example, Excel);
- using software for editing photos, videos or audio files.

#### List B:

- creating presentations or documents that integrate text, pictures, tables or diagrams;
- using advanced functions for organizing and analyzing data, such as sorting, filtering, using formulas, creating charts;
- writing code in a programming language.

### Levels of information skills:

1

**No skills**  
did not use any of the skills in the last 3 months

2

**Basic skills**  
performed one or more operations from list A, but did not perform any from list B

3

**Above basic skills**  
performed at least one operation from list B

Each area of competence was adapted to Ukrainian realities content and language-wise.

Based on the collected data for each of the areas of competence, the overall level of digital skills – Overall digital skill indicator – is measured.

#### No skills

no digital skills in all four areas (information, communication, problem solving, creating digital content) and/or did not use Internet services for the last 3 months

#### Low skills

no digital skills in one of the four areas of competence

#### Basic skills

digital skills in all four areas at a level no lower than basic

#### Above basic skills

digital skills in all four areas at a level no lower than above basic

### How has the methodological framework changed since 2019?

The focus of the study, its components and target groups are adapted according to the strategic needs of the Ministry of Digital Transformation within each wave of the study. An important aspect in the second [2021] and third [2023] waves is reconceptualizing the methods used to study public opinion, the definition of target audiences and the tools used in view of the current context in Ukraine, such as the 2021 coronavirus pandemic, as well as the context of full-scale war.

A methodological account of the three waves is presented below to provide a better understanding of the research.

Year	Research components	Target audiences	Data collection methods	Sample	
2019	survey of the adult population	the population of Ukraine aged 18–70 (except for the population of the occupied territories of Donetsk and Luhansk regions, as well as the AR of Crimea)	face-to-face interview	1 800 people	
	survey of teenagers	the population of Ukraine aged 10–17 years (except for the population of the occupied territories of Donetsk and Luhansk regions, as well as the AR of Crimea)	group survey (questionnaire) in schools	400 people	
	survey of the population of the temporarily occupied territories of Donetsk and Luhansk regions	population aged 18–70 in non-Government-controlled parts of Donetsk and Luhansk regions	face-to-face interview	400 people	
	survey of the population with hearing impairments	population of Ukraine aged 18-59 with hearing impairments	survey (questionnaire)	200 people	
	ФГД		urban population of Ukraine aged 30-60 years	offline FGD	2 FGDs for 8 people
			rural population of Ukraine aged 30-60 years	offline FGD	2 FGDs for 8 people
2021	survey of the adult population	the population of Ukraine aged 18–70 (except for the population of the occupied territories of Donetsk and Luhansk regions, as well as the AR of Crimea)	face-to-face interview	1 800 people	
	survey of teenagers	the population of Ukraine aged 10–17 years (except for the population of the occupied territories of Donetsk and Luhansk regions, as well as the AR of Crimea)	self-completed questionnaire using an online link	400 people	
	survey of the population of the temporarily occupied territories of Donetsk and Luhansk regions	population aged 18–70 in non-Government-controlled parts of Donetsk and Luhansk regions	face-to-face interview	400 people	
	survey of the population with hearing impairments	population of Ukraine aged 18-59 with hearing impairments	survey (questionnaire)	200 people	
	FGD		medical professionals (doctors)	offline FGD	2 FGDs for 4 people
			education professionals (teachers)	offline FGD	2 FGDs for 4 people
employees of local self-government bodies and municipally owned enterprises (MOEs)			offline FGD	2 FGDs for 4 people	
elderly			offline FGD	2 FGDs for 4 people	

## Changes in the framework in the second wave of the study [2021]:

1

### Survey of young people

Similar to 2019, the youth survey aimed at measuring the digital literacy of schoolchildren, as well as their attitude to digital technologies. However, due to pandemic restrictions, the method of data collection has been changed. Instead of a survey at schools (schools were randomly selected from the general list of schools), self-completion of a questionnaire using an online link was run. This method made it possible to avoid such obstacles as:

- 🔗 **Limited access to schools.** In accordance with pandemic-related measures, schools had a number of restrictions preventing outsiders from entering the institution. Notably, it was necessary to obtain a number of permits for conducting survey at schools, which was recognized as inappropriate.
- 🔗 **Lack of separate classes or small number of children.** Due to the coronavirus prevalence in a region or an individual school, classes could be closed for lockdown. Accordingly, they were unavailable for interviews at the time of project implementation.

2

### FGDs

The target audiences of the study were expanded to accommodate new needs of the Ministry of Digital Transformation. Within the framework of this component of the study, the focus was made on professional groups [representatives of the healthcare and education areas, employees of local self-government bodies and MOEs] and the elderly. The goal was to get insights from the target audiences regarding their needs in digital skills development and existing concerns that can/should be addressed through the formation of a product line of digital literacy training courses.



Year	Research components	Target audiences	Data collection methods	Sample	
2023	survey of the adult population	population of Ukraine aged 18–70 years <b>The following regions were excluded from the study:</b> Donetsk and Luhansk, as well as the Autonomous Republic of Crimea. <b>Partially excluded regions:</b> communities of Zaporizhzhia and Kherson regions occupied since 24 February 2022	face-to-face interview	2 005 people	
	survey of teenagers	population of Ukraine aged 10–17 years <b>The following regions were excluded from the study:</b> Donetsk and Luhansk, as well as the Autonomous Republic of Crimea. <b>Partially excluded regions:</b> communities of Zaporizhzhia and Kherson regions occupied since 24 February 2022	face-to-face interview / self-completed questionnaire using an online link	402 people	
	survey of the population with hearing impairments	population of Ukraine aged 18–59 with hearing impairments	survey (questionnaire)	400 people	
	FGD	medical professionals (doctors)		online FGD	1 FGD for 8 people
		education professionals (teachers)		online FGD	1 FGD for 8 people
		employees of local self-government bodies and MOEs		online FGD	1 FGD for 8 people
		representatives of the national government (ministries, central executive authorities, etc.)		online FGD	1 FGD for 8 people
		entrepreneurs / business executives		online FGD	1 FGD for 8 people
		elderly (population aged 60+)		online FGD	1 FGD for 8 people
		teenagers (population aged 14–17)		online FGD	1 FGD for 8 people
	youth (population aged 27–35)		online FGD	1 FGD for 8 people	

## Changes in the framework in the third wave of the study [2021]:

1

### Survey of the population of the occupied territories of Donetsk and Luhansk regions.

This component was completely excluded from the third wave of research since it was impossible to ensure security of interviewers and respondents during the survey in the temporarily occupied territories of Donetsk and Luhansk regions.

2

### Survey of the adult population.

Due to the security factor, the following changes have been made:

- ➔ The communities of Zaporizhzhia and Kherson regions, which have been occupied since 24 February 2022, were not selected for the study.
- ➔ Total sample size was increased to 2,000 respondents since the population of the temporarily occupied territories of Donetsk and Luhansk regions was excluded from the study.

3

### Survey of teenagers:

- ➔ Due to the security factor, the communities of Zaporizhzhia and Kherson regions occupied since 24 February 2022 were not selected for the study.
- ➔ Data collection method was different for conditionally safe and frontline areas. Personal (f2f) survey was used in 17 oblasts of Ukraine and the city of Kyiv that are considered conditionally safe areas. Self-completion of the questionnaire via an online link is used in 5 regions of Ukraine due to the unstable security situation (Zaporizhzhia, Mykolaiv, Sumy, Kherson and Kharkiv regions).

4

### Survey of population with hearing impairments.

The sample was increased to 400 respondents. With the support of Ukrainian Society of the Deaf (USD), video guidance in sign language was added. It enabled this populatio

**FGD.**

The target audience was expanded in accordance with the new needs of the Ministry of Digital Transformation. As part of the implementation of this wave of research, focus group discussions were held with representatives of national authorities (ministries, central executive authorities, etc.), entrepreneurs / business executives, teenagers (14–17 years old) and young adults (27–35 years old). Focus areas was also expanded to include Internet usage practices and digital skills in wartime; digital literacy in a professional context; digital education and training; Internet security.

As mentioned above, the basic framework for measuring digital literacy of the population is the Digital Skills Indicator, calculated based of the Eurostat survey on the use of ICT. One of the goals of this study is to analyze the changes in the digital skills of the population of Ukraine – therefore, certain indicators/questions are repeated between waves. At the same time, each wave of study has separate focuses, which also inform the methodology. The following is a breakdown of indicators that are distinct and repeated for the second [2021] and third [2023] waves of the study.

Indicators	2021	2022
<b>Access to the Internet</b>		
Access to the Internet from home	+	+
Reasons for not having Internet connection	+	+
Places of use of the Internet for the last six months	+	-
<b>Specifics of using the Internet</b>		
Internet as a basic need in terms of access to food, security, etc.	-	+
Assessment of quality of the Internet	-	+
When the Internet was used last time?	+	-
Frequency of the Internet use	+	+
Duration of using the Internet on weekdays / weekend	+	-
Duration of using the Internet for work / study and self-development / leisure	-	+
Changes in the duration of use of the Internet	+	-
Actions for accessing the Internet during blackouts	-	+
Devices used to access the Internet	+	-
Purposes of using the Internet during the last 3 months (17):	+	+
→ communication (4)	+	+
→ access to information (3)	+	+
→ public and political participation (2)	+	+
→ professional life (3)	+	+
→ creativity (1)	+	+
→ entertainment (2)	+	+
→ other (2)	+	+
Practices of using the Internet for educational, professional or personal purposes during the last 3 months (3)	+	+
Interaction with government bodies or public services via the Internet for private purposes during the last 12 months (3)	+	+
Practices of using the Internet that first occurred during the pandemic	+	-
Impact of the Internet on well-being and resilience during the (UK Consumer crisis Digital Index 2021)	+	-
<b>Digital skills</b>		
Self-assessment of changes in digital skills due to the pandemic / over the past yeah	+	+
Computer or mobile device usage practices (3)	+	+
Software usage practices (7)	+	+

Indicators	2021	2022
Sources of help in solving problems	+	-
Use of artificial intelligence	-	+
<b>Internet security</b>		
Use of measures to protect personal information and data on the Internet	-	+
Practices of taking measures to protect personal information and data on the Internet	-	+
Experience of encountering security problems on the Internet (9) / (11)	+	+
Readiness to spend money to improve information protection and personal data security	-	+
Practices of avoiding the transfer of information that could potentially be useful to the Russian Federation through instant messaging services	-	+
Evaluation of instant messaging services regarding the risk of information leakage	-	+
Practices of refusing to use the Internet for security reasons (6)	+	-
Backup practices	+	-
<b>Internet commerce</b>		
Online shopping experience (when was the last time)	+	-
Goods and services purchased online in the last 12 months	+	+
Reasons for refusing online shopping	+	-
Manufacturer check during online shopping	-	+
<b>Digital education</b>		
Sources of information about online self-educational platforms	-	+
Practices of using Ukrainian platforms for online self-education	-	+
Change in the frequency of using platforms for online self-education over the past 6 months	-	+
Reasons for not using Ukrainian platforms for online self-education	-	+
Awareness of Diia.Osvita educational platform	-	+
Experience of using online services provided by state and local institutions	+	+
Reasons for not using online services provided by state and local institutions	+	+
Practices of receiving online services over the past 12 months (which services were received)	+	-
Awareness of projects / products of the Ministry of Digital Transformation	+	-
Experience of using products of the Ministry of Digital Transformation	+	-
Platforms where educational series were watched	+	-
Educational series that were watched	+	-

Indicators	2021	2022
Availability of a Digital Education Hub in the settlement	+	+
Experience of visiting a Digital Education Hub	+	+
Experience of completing Digitograms	+	-
Having the Diia app	+	-
Reasons for non-using Diia app	+	-
Practices of using the app	+	-
<b>Development of digital skills</b>		
Need in development of digital skills	+	+
Reasons for having no need in development of digital skills	+	+
Learning needs (16)	+	-
Need for training courses (33)	+	-
Priority training formats	+	+
<b>Life satisfaction</b>		
Working conditions (3)	-	+
Efficiency in creating products / services at work (3)	-	+
Social environment (colleagues, friends , acquaintances, etc.) (2)	-	+
Feeling of fulfillment in life (2)	-	+
Level of readiness to take responsibility for solving problems (2)	-	+
Innovative approach in work (2)	-	+
Financial growth over the past 12 months (2)	-	+
Level of data security at the workplace (2)	-	+
Self-education practices (2)	-	+
Average monthly income per person	-	+
Level of English language proficiency	-	+
Availability of devices	-	+



**As the comparison of indicators in 2021 and 2023 proves, the following focuses have been added in 2023:**

**📌 Impact of digital skills on life satisfaction.**

In the study, focus was made on a relationship between digital skills of a person and their satisfaction with various aspects of life, such as the social environment, professional fulfilment, self-education, and others. Examining these aspects helps understand how effectively training in digital technologies can improve the quality of life and contribute to the development of the individual and the community.

**📌 Cyber security and cyber hygiene.**

In this block, the focus is on everyday practices of the population in ensuring their safety and the safety of their data in the digital environment: what tools they use, whether they have encountered problems related to cyber security, etc. This makes it possible not only to measure the awareness of population regarding cyber security, but also to determine possible directions for increasing the level of cyber hygiene and security in the Internet environment.

**📌 Self-education practices using online platforms.**

During the previous waves of the study, the respondents were asked if the development of digital skills is relevant to them. In current context of Ukraine, the focus has been expanded and new aspects of self-education using online platforms have been added: what platforms are used, reasons for not using them, etc. Analysis of these aspects helps better understand the popularity and effectiveness of online education in the context of modern educational environment and to identify trends that may determine future development of this field of education.

These focuses are reflected in all components of the study – survey of the adult population, survey of adolescents, survey of people with hearing impairments and FGDs with different target groups.

**New challenges and limitations of 2023.**

Comparing the results of study before and after a full-scale war requires clear understanding of the changed population structure of Ukraine. Internal and external migration processes since the beginning of the full-scale invasion **do not make it possible to make reliable comparisons between the findings of this and two previous waves of the study.**

The distribution of the permanent population of Ukraine by sex and age (and by other parameters necessary for constructing the sample) was last updated on 1 January 2021. Therefore, currently there is no current data on the sex-age structure of the population of Ukraine – intensive migration processes took place both outside and inside the country. According to the IOM Snapshot Report “Population Figures and Geographic Distribution – Round 14, 3-25 September 2023,” there are 3.674 million IDPs in Ukraine. The main regions of origin of IDPs are Donetsk (24%) and Kharkiv (22%) oblasts, while the regions that received most IDPs are Dnipropetrovsk (14%), Kharkiv (13%), Kyiv (8%) oblasts and the city of Kyiv (10%). Another IOM report “Registered IDP Area Baseline Assessment. Raion level – Round 27, August 2023” indicates that 61% of IDPs are women, 39% are men. The age structure of displaced persons is as follows: under 18 years – 28%, 18–59 years – 54%, over 60 years – 18%. This data does not make it possible to make corrections to the sex-age structure of communities, but illustrates the differences in the proportions between the local population and IDPs.

**Prospects for further research.**

The level of digital skills is one of key performance indicators in the Digital Decade, which defines Europe’s ambition in the field of digital technologies – notably, by 2030 at least 80% citizens (defined as the percentage of people aged 16 to 74) have at least basic digital skills. The study of the fluent digital environment entails constant updating and adaptation of the existing research methodology to ensure that collected data remains relevant.

Following the progress made by the European Commission in 2019-2022, the integrated 2022 Digital Skills Indicator [DSI] has been updated and adapted in accordance with the new conceptual framework of the digital development of European society and technological progress.

**The Digital Skills Indicator 2.0 is a composite indicator based on certain operations related to the use of the Internet or software:**

- 📌 information literacy and literacy in working with data;
- 📌 communication and cooperation;
- 📌 digital content manipulation skills;
- 📌 problem solving skills;
- 📌 internet safety skills.

Individuals who have performed certain operations are assumed to have the appropriate skills.

### What has changed in the framework compared to 2021?

- 📌 **First**, one area of digital competence – Internet safety – was added to the scope of study.
- 📌 **Secondly**, the approach to measuring digital skills and the list of operations that can be performed by individuals within each competence have been revised.
- 📌 **Thirdly**, the scale of general level of digital skills has been expanded. According to the new methodological framework, it stipulates seven (rather than four like in 2017) levels: no skills, limited digital skills, narrow skills, low skills, basic skills, above basic skills and at least basic skills.
- 📌 **Fourth**, the target audience of the study has been expanded – according to the new methodology, the survey is conducted among the population aged 16–74.

Taking into account the above-mentioned changes to methodology, the purpose of the third wave of study (namely, analysis of the dynamics of the digital inequality of the population) and the complicated sociopolitical situation in the country, it was decided not to change the methodological framework in 2023. However, to enable data comparison with European countries, the next waves of study should be content-wise and language-wise adapted in accordance with the [methodological framework updated in 2022](#).

The detailed methodology of the third wave of study [2023] is presented below.

#### 👤 Component 1

### Adult population survey (18–70 years)

#### 🎯 Purpose

To conduct an analytical review of updated quantitative data on digital literacy of the population of Ukraine, to perform a detailed comparative analysis of these data with the findings of previous studies in 2019/2021.

#### 👥 General sample

Population of Ukraine aged 18 to 70 years.

#### 👉 Regions excluded from the study

Donetsk and Luhansk regions, as well as the Autonomous Republic of Crimea. Donetsk region was excluded due to security factors for field work.

#### 👉 Partially excluded regions

Communities of Zaporizhia and Kherson regions, which have been occupied since 24 February 2022, are not included in the general sample.

#### 📌 Data sources

The sample is based on available data from the State Statistics Service of Ukraine. When forming the sample, data on the movement of the population is taken into account.

#### 👤 Sample size

2,005 people aged 18–70 years.

#### 📊 Type of sampling

Stratification, quota.

#### 🔍 Quotation parameters

- age;
- sex;
- place of residence (urban/rural).

### Data collection method

F2f interview at the respondent's place of residence.

## Component 2

### Survey of adolescents (10–17 years)

#### Purpose

To measure digital literacy of young people of middle and senior school age.

#### General sample

Population of Ukraine aged 10 to 17 years.

#### Regions excluded from the study

Donetsk and Luhansk regions, as well as the Autonomous Republic of Crimea. Donetsk region was excluded due to security factors for field work.

#### Partially excluded regions

Communities of Zaporizhia and Kherson regions, which have been occupied since 24 February 2022, are not included in the general sample.

#### Data sources

The sample is based on available data from the State Statistics Service of Ukraine. When forming the sample, data on the movement of the population is taken into account.

#### Sample size

402 people.

#### Type of sampling

Stratification, quota.

### Quotation parameters

- age;
- sex;
- place of residence (urban / rural).

### Data collection method

- f2f survey – used in 17 oblast and the city of Kyiv which can be considered conditionally safe areas,
- self-completion of the questionnaire using an online link – in 5 regions of Ukraine due to the unstable security situation (Zaporizhia, Mykolaiv, Sumy, Kherson and Kharkiv regions).

### Comment on the selected methods

two methods of data collection are used because the study was conducted during the period of full-scale war in Ukraine, and therefore, it was necessary to take into account the restrictions related to the security of respondents during the study. Given the age of the respondents, the security factor is key. Therefore, it was proposed to collect data by self-completion of the questionnaire via an online link in the frontline regions (Zaporizhia, Mykolaiv, Sumy, Kherson and Kharkiv regions), where face-to-face interviews were impossible because of unstable security situation.

## Component 3

### Survey of population with hearing impairments

#### Purpose

To collect quantitative data on digital literacy of population with hearing impairments.

#### General sample

Population of Ukraine aged 18–59 with hearing impairments.



### 👉 Regions excluded from the study

Donetsk and Luhansk regions, as well as the Autonomous Republic of Crimea. Donetsk region was excluded due to security factors for field work.

### 👉 Partially excluded regions

Communities of Zaporizhia and Kherson regions, which have been occupied since 24 February 2022, are not included in the general sample.

### 📌 Data sources

the sample is based on the available statistics from the Ukrainian Society of the Deaf.

### 👤 Sample size

404 people.

### 📊 Type of sampling

Stratification, quota.

### 🔍 Quotation parameters

- age;
- sex.

### 📄 Data collection method

Self-completion of the questionnaire via an online link.

### 👤 Доступ до цільової аудиторії

Through civil society institutions that work with people with hearing impairments – the Ukrainian Society of the Deaf.

## 🔍 Component 4

### Focus group discussions

#### 🎯 Purpose

To get insights from the target audience regarding digital literacy in their lives and concerns that can/should be addressed through the formation of a product line of digital literacy training courses.

#### 👤 Target audiences

In accordance with the areas / directions / professions supported and developed within Diia.Osvita project, we proposed to single out two categories among which a total of 8 FGDs were conducted.

#### 1. Professional groups – a total of 5 FGDs; 1 for each TA

- medical professionals (doctors),
- education professionals (teachers),
- employees of local self-government bodies and MOEs,
- representatives of the national government (ministries, central executive authorities, etc.),
- entrepreneurs / business executives.

#### 2. Age groups – a total of 3 FGDs, 1 for each TA

- elderly (population aged 60 and over),
- teenagers (population aged 14–17),
- youth (population aged 27–35).

#### 📄 Data collection method

Online, to ensure coverage of representatives of various regions, types of settlements.

#### 👤 Aggregate categories used in the analysis

Aggregate categories are a necessary tool for the analysis, since they enable systematic review and outlining of the main aspects of the study. The following aggregations were used during the report writing.

Indicator	Aggregate category	Response option in the questionnaire
<b>Macro region</b>	West	Volyn, Zakarpattia, Ivano-Frankivsk, Lviv, Rivne, Ternopil, Khmelnytskyi, Chernivtsi regions
	Southern	Odesa, Mykolaiv, Kherson regions
	Northern	Zhytomyr, Kyiv, Sumy, Chernihiv regions and the city of Kyiv
	East	Dnipropetrovsk, Zaporizhia, Kharkiv regions
	Central	Vinnytsia, Kirovohrad, Poltava, Cherkasy regions
<b>Type of settlement</b>	Regional Center	Regional Center
	City	A city with a population of more than 50,000 people
		A city with a population of less than 50,000
		Urban-type village
Village	Village	
<b>Financial status</b>	Below average	We don't even have enough money for food
		We have enough money for food, but it is difficult to buy clothes
	Average	We have enough money for food and clothes and we can save a little, but not enough to buy expensive things (like a refrigerator or a TV)
	Above average	We can afford to buy some expensive things (like a TV or a refrigerator)
		We can afford to buy anything we want
<b>Type of employment</b>	Working population	I have my own / family business / self-employed
		I work in a private organization / enterprise
		I work in a state organization/institution (municipal health service provider, community school, hospital, etc.)
	Student	Student
	Temporarily unemployed population	Temporarily unemployed / maternity leave
Pensioners / unemployed due to health	Retired / unemployed due to health	
<b>Education background</b>	Incomplete / full secondary	Incomplete secondary
		Full secondary
	Vocational	Vocational technical
	Incomplete tertiary / tertiary / scientific degree	Incomplete tertiary
Tertiary / scientific degree		

# Executive Summary

## Internet usage

1

### The share of Internet users is growing

From 2019 to 2023, the share of Internet users in the total structure of the population increased by 8% and now amounts to 94%. The frequency of Internet use practices is directly related to the respondent age. Among the oldest category (60–70 years old), 71% respondents use the Internet every day, and among the youngest adults (18–29 years old), it is 96%.

2

### Internet is a basic need for a large part of Ukrainians




91% Ukrainian adults, 84% people with hearing impairments and 92% of teenagers agree that access to the Internet is one of basic needs of a modern person, just like access to food, security, etc.

## Digital skills of the population

1


The level of digital skills of the population has a trend of steady growth. It manifested in the reduction of the share of adults with no digital skills and the increase of the population with the level of basic skills and above.

### As of 2023, the following shares of population groups have digital skills:

-  93% adult population of Ukraine aged 18–70 (+8% since 2019),
-  95% teenagers aged 10–17<sup>1</sup>,
-  99% people with hearing impairments, 18–59 years old (+15% in 4 years).

# 93,8%

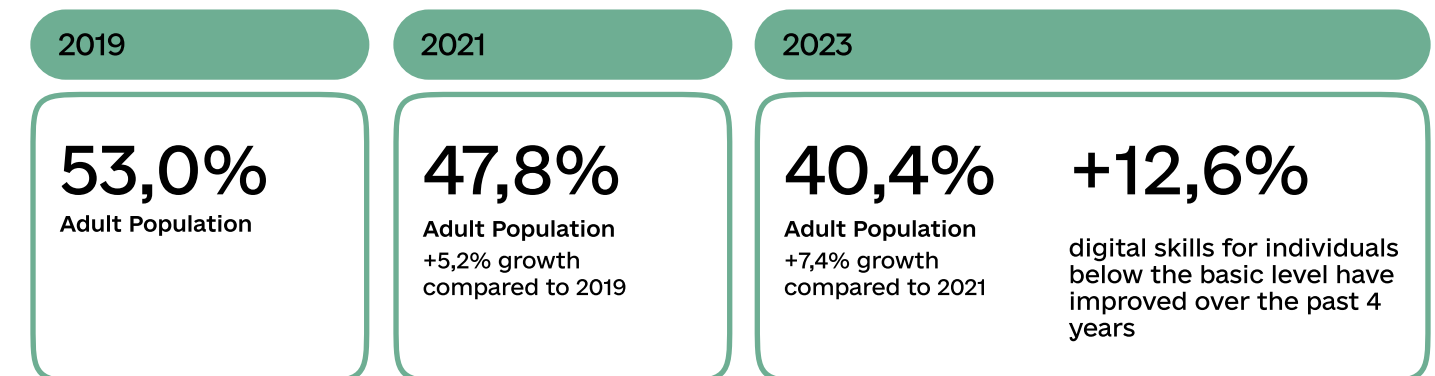
of the adult population has access to the Internet at home

 +5,4% since 2019

# 83,2%

of respondents are satisfied with the quality of the Internet in their place of residence

## Dynamics of the share of the adult population with a digital skills level below the basic level



# 38,0%

of the adult population of Ukraine has Above Basic Digital Skills

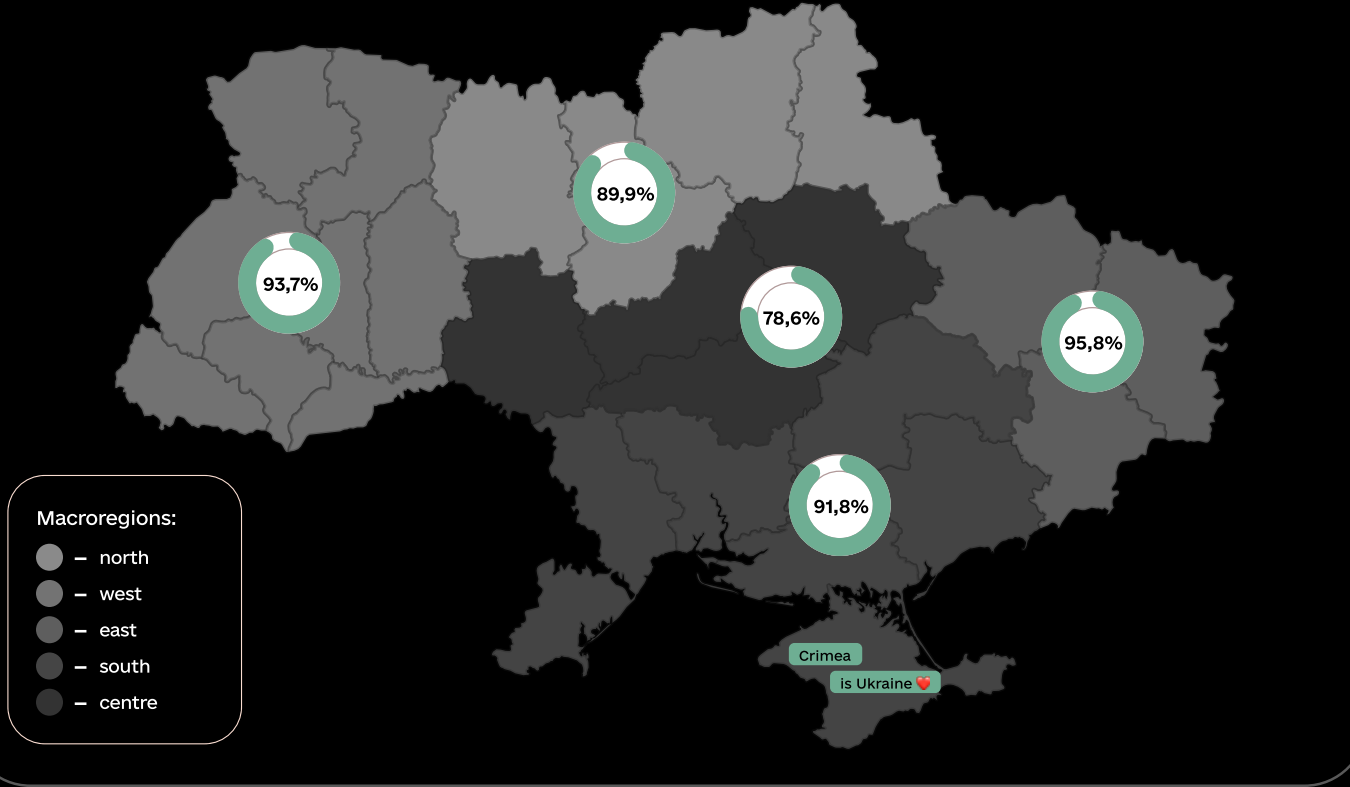
 +12,5% since 2019

<sup>1</sup> – There are no statistically significant changes in the share of teenagers with this or that level of digital skills, the value fluctuates within 5%.

# Digital skills in Ukraine by macroregion, 2023

\*the share those who have Basic & Above basic skills

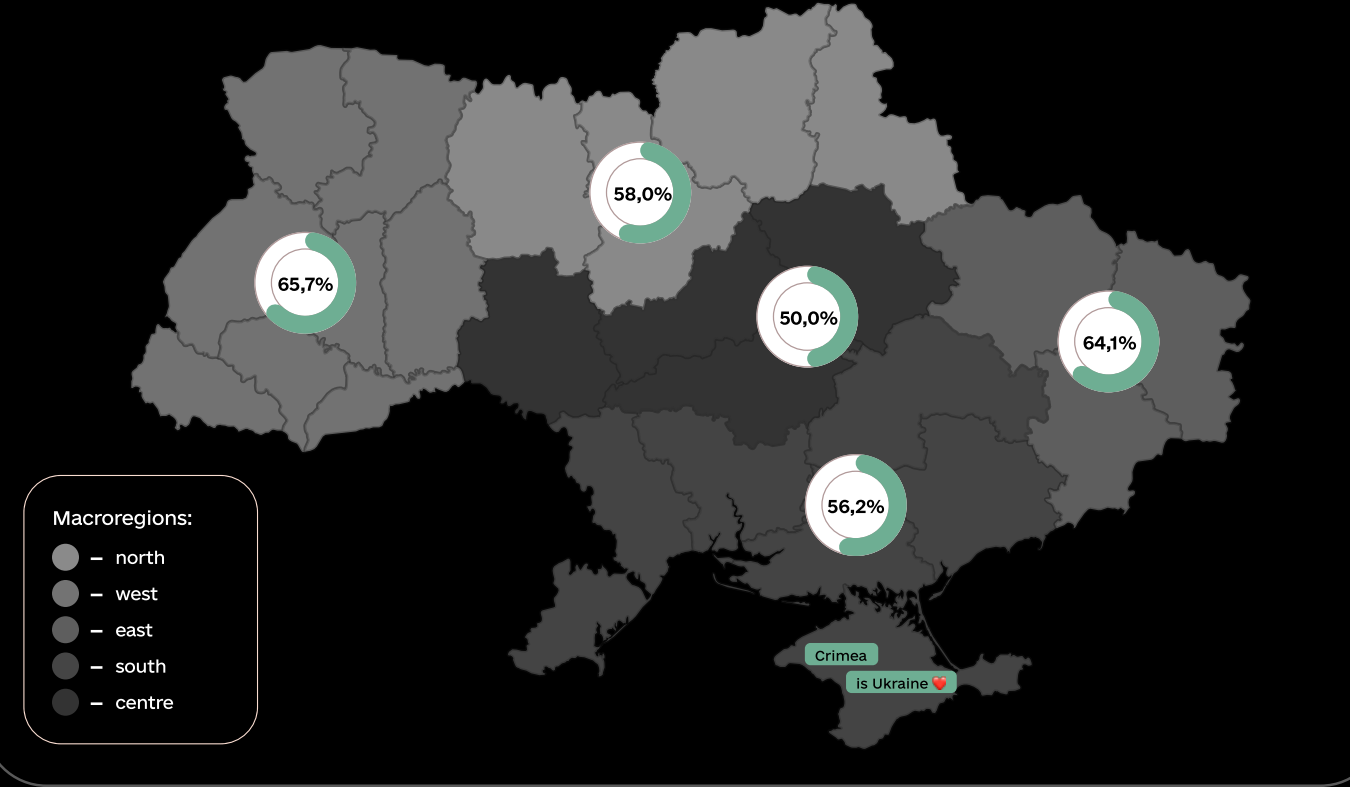
## Information skills



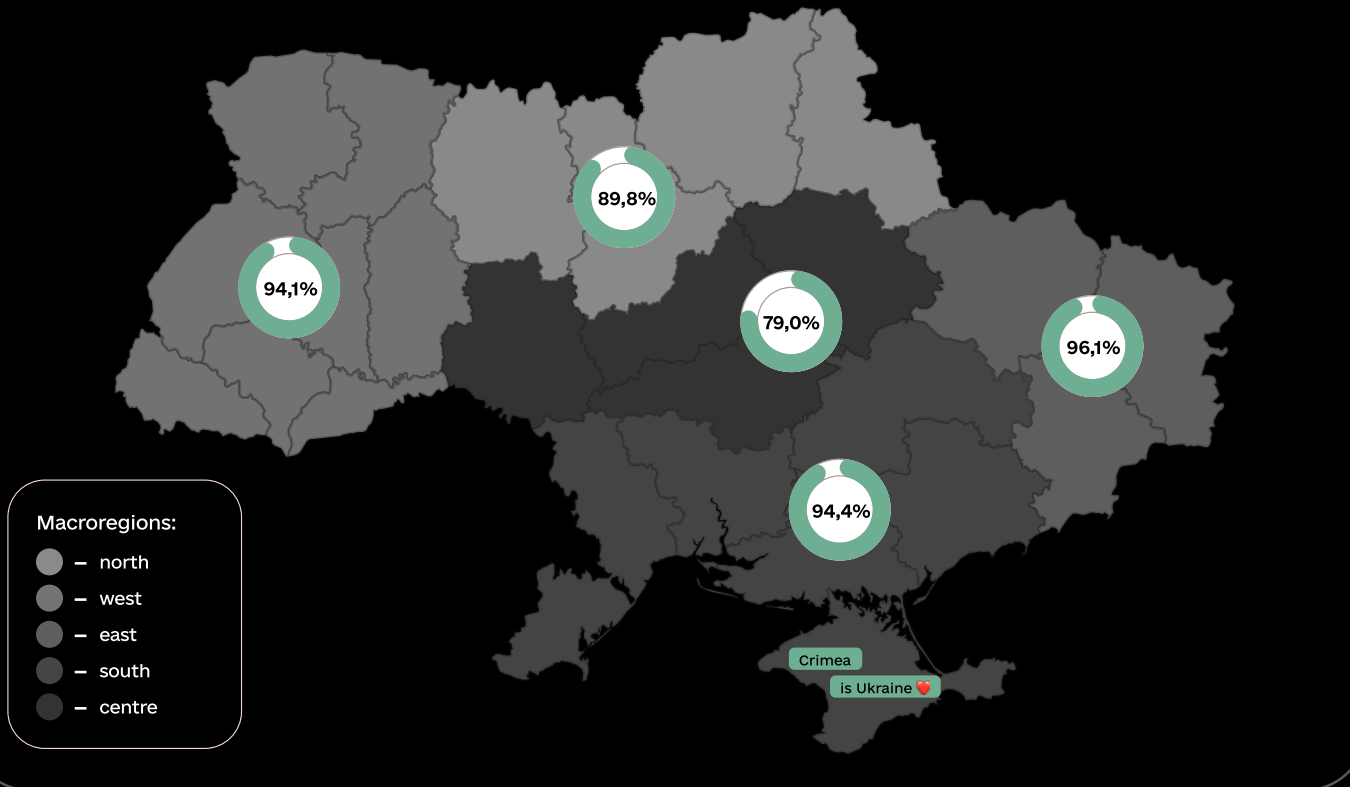
# Digital skills in Ukraine by macroregion, 2023

\*the share those who have Basic & Above basic skills

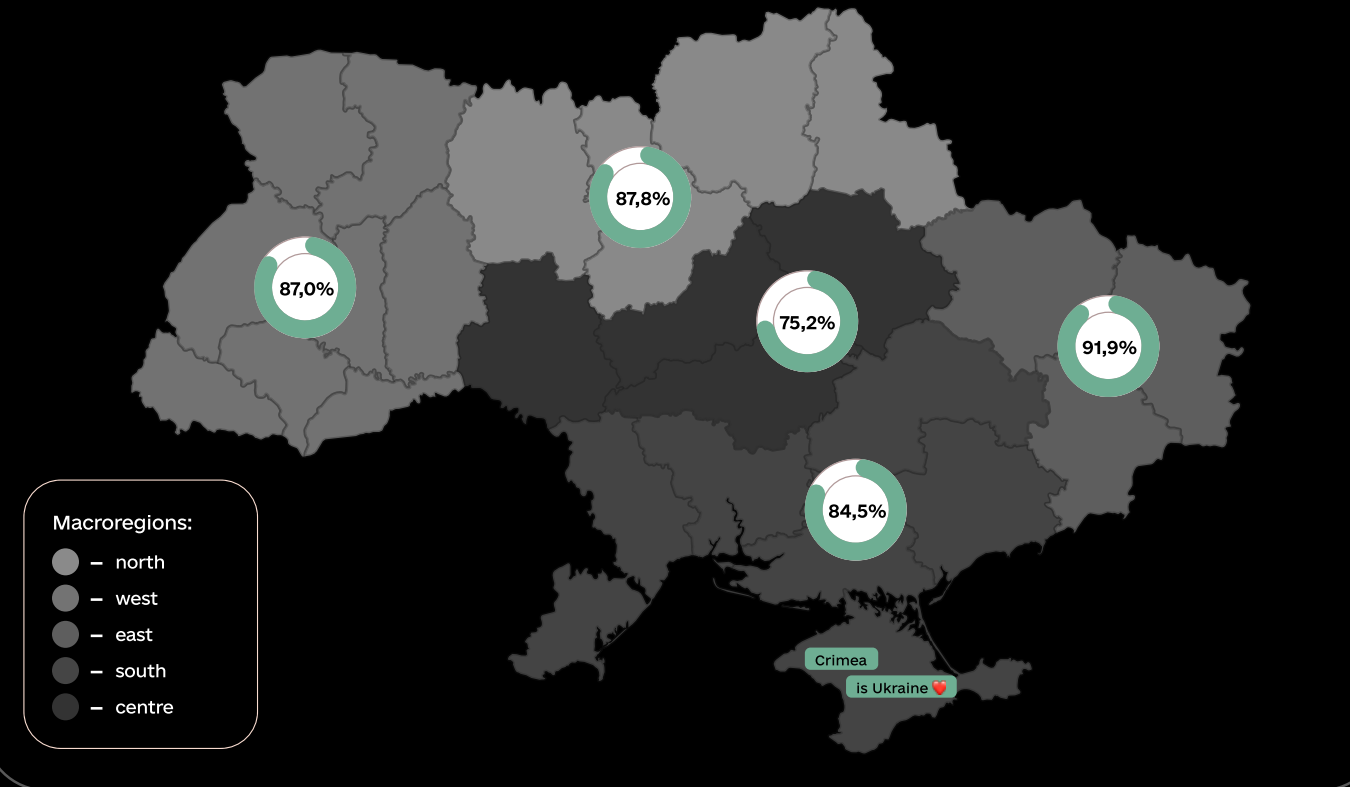
## Software skills for content manipulation



## Communication skills



## Problem solving skills





## Self-development and online education practices

1





Improved digital skills motivate people to actively strengthen their knowledge and self-development. It is manifested in the increased percentage of population that has an actual demand for training, correlated with an increase in the level of digital literacy: from 22% among “no skills” to 77% with “above basic skills”, among the adult population (18–70 years old).

2

The approach to choosing an online learning strategy depends on the age group. The results of the focus group discussions indicate the diversity of approaches of different age groups to online self-education and the choice of platforms for raising awareness of certain topics. Teenagers prefer to use educational content on specific request, in particular through messengers, YouTube and short videos on social networks. Young people use YouTube, Prometheus and Go IT. The elderly normally use search engines rather than specific platforms or social networks.

3

The following trends are observed in the practices of using digital technologies:

-  the popularity of Internet banking has increased for each of the target groups,
-  adults are increasingly using technology for public and political participation, and teenagers have become more interested in news reports,
-  the adults (in particular, people with hearing impairments) report increasing need/relevant of online education,
-  the importance of digital technologies in the workplace for people with hearing impairments is increasing.


# 58,3%

of the adult population believes that acquiring digital skills is relevant

 +10,9% since 2019

# 85,0%

of adolescents believe that acquiring digital skills is relevant

 +17,5% since 2019

# 42,2%

of the adult population regularly devotes time to self-study and improvement of knowledge

# 22,8%

of people with hearing impairments regularly devote time to self-study and improvement of knowledge

# Economic benefits of digital skills in Ukraine

The Ministry of Digital Transformation team together with Joble conducted a research on vacancies on the web-based job search platforms to measure economic benefits of digital skills among employees. The sample size is 1.74 million vacancies advertised in the period from 1 January 2021 to 27 October 2023. The general list of digital skills was formed by the Ministry of Digital Transformation team based on the analysis of government policies on the development of digital literacy in the countries of Europe and Asia. The total number is 1,035 individual digital skills, which have been divided into 3 general categories: no skills, basic skills and above basic skills.

## The findings of the study demonstrate:

- Among the vacancies with a requirement for digital skills, the highest (36.3%) demand is for above basic skills – for example, cloud technology or software development, artificial intelligence, etc. For Ukrainian society, this is important from the perspective of economic development and recovery, because these are advanced digital skills that contribute the most to the increase of the gross domestic product (GDP) through higher employee incomes, as well as innovativeness and productivity of employees at the workplace.
- Employees with digital skills receive 81.3% higher wages than those who have no skills. According to the study findings, having above basic skills is associated with higher satisfaction with professional life by an average of 17-29% compared to those who have no skills. 68.5% of respondents with above basic skills and only 40.0% of respondents with no skills claimed that they were achieving their professional goals (the difference is 28.5%).
- Median salary with digital skills is €1,130.9 as of October 2023.
- Above basic digital skills add up €110.8 billion to the annual GDP of Ukraine.
- The gap in income between 'digital' and 'non-digital' employees is observed in the Centre of Ukraine (8 oblasts) where it amounts to €570. It is almost twice as low as in the most developed macro-regions – West (€1,040) and South (€1,040).

Despite the limitations of the sample – notably, the vacancies from the web resource were considered and offline job advertisements were not – the collected data can be considered a more accurate basis for economic analysis than the findings of the study because they cover a longer period, take into account sociopolitical situations and contain a bigger number of research units.

# 81%

of Ukrainians believe that improved digital skills of the population can positively affect the economy of Ukraine in general

# 1,7 million

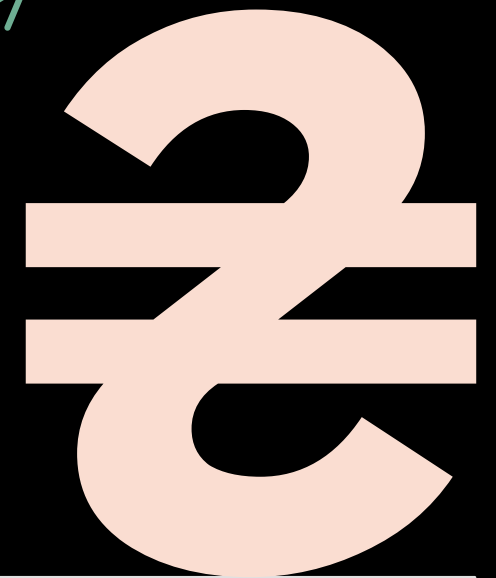
advertised job vacancies were analyzed

# 81,3%

the gap in income between «digital» and «non-digital» employees

# ~ €110,8 billion

digital skills for individuals below the basic level have improved over the past 4 years



# Role of digital skills in achieving success

1

**51% Ukrainians are satisfied with their regular work. Among people with hearing impairments, this percentage is twice as low – 24%.**

The perception of these target groups' satisfaction with their environment, willingness to take responsibility and engage in self-development also differ significantly. However, the share of respondents who report improvement of financial situation over the past year is almost the same – 14% among adult Ukrainians and 11% among people with hearing impairments.

2

**More than one in three Ukrainians (36%) do not have policies on cyber security and/or cyber hygiene at their workplace, and one in four (26%) says there are no effective measures to protect confidential information.**

3

**91% of teenagers believe that digital skills are necessary for their education, and 84% perceive them as important for their future careers.**

4

**96% teenagers use the Internet to communicate with family and friends, and 58% do not feel lonely thanks to the Internet.**

84% respondents aged 10–17 consider that they spend a lot of time on the Internet, and almost one in three teenagers (29%) feels anxiety when not being able to use the Internet.

E-commerce is a common practice among teenagers. Almost 3/4 of children bought clothes during the year (72.5%), the indicator increased by 17.2%). The second position in popularity of consumption among teenagers is household goods (45.4%; share increased by 21.3% from 2021). Almost a quarter of teenagers bought online games, software and computer equipment (24.3%).

5

**Approximately one in three teenagers (31%) does not know how to protect their data when using the Internet, and 35% of the surveyed teenagers consider their digital skills not good enough.**

31% of children with above basic digital skills are concerned if their skills are good enough. Among those who have low and basic skills, the share of those concerned about the quality of their skills is at least 10% higher and amounts to 42% and 46%, respectively.

**Children living in villages are more likely to be concerned if their digital skills are good enough – 41% against 33% in cities and 32% in regional centers.** In addition, they are less aware of how to protect their data when using the Internet. The percentage of those who report not being aware among rural youth is 39%, while among urban youth and residents of regional centers, 23% and 29%, respectively. This means that adolescents who live in rural areas need additional support in terms of building their digital skills, in particular, in the field of cyber hygiene.

## Internet security

1

**Most of the population uses one or another measure for data security on the Internet.**

The list of actions aimed at protecting information and their frequency depend on the level of digital skills. The higher the level of digital literacy, the more various measures a person uses to secure data on the Internet. Notably, people with “no skills” take one action on average, and people with “above basic skills,” up to five different actions.

2

**Over the past 2 years, the frequency of data security problems on the Internet has increased.**

Among adults (ages 18–70), 60% experienced at least one data breach in a 12-month period, 14% more than in 2021.

3

**8 out of 10 teenagers have experienced a violation of their data security on the Internet.**

In terms of the reaction to these situations, differences between age groups are observed: younger teenagers most often rely on the help of close adults, while the older group shows a greater willingness to solve problems independently. Teenagers increasingly realize the importance of developing skills against illegal activities on the Internet, as their decisions and interactions with parents affect the level of cyber security in the digital space.

4

**One in three Ukrainian is ready to pay for services that increase data security in the digital space, but currently only 5% have experience using paid specialized software.**

**8,8%**

of adolescents never follow data protection online

**35,2%**

of adolescents fell victim to phishing since 2021

**59,6%**

of the adult population experienced problems with illegal activities on the internet in 2023

+13,9% since 2021

**55,3%**

of people with hearing impairments experienced problems with illegal activities on the internet in 2023

-12,1% since 2021

**52,3%**

of teenagers experienced problems with illegal activities on the internet in 2023

+12,1% since 2021



Section

1

# Internet usage



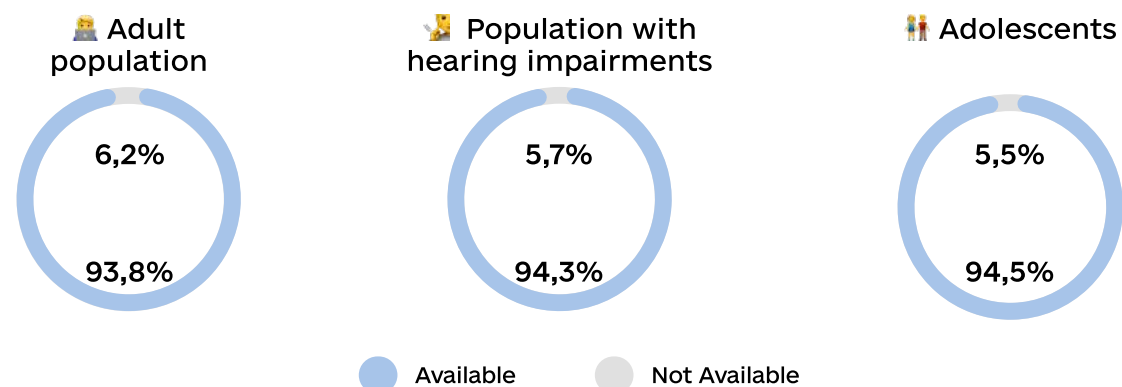
# Internet usage

According to the [Internet World Stat](#) portal that studies the world statistics of Internet users, as of January 2022, the share of the population of Ukraine that used the Internet was almost 95%. Despite the changes in the sociodemographic structure and migration that take place since the beginning of the full-scale invasion, the results of the present study confirm the above statistics. **Notably, from 94% to 95% (depending on the target group) have access to the Internet at home. In general, over the past 4 years, the average percentage of users among the adult population (18–70 years) has increased by 6% (in 2019, the share of users among the adult population was 88%).**

It is assumed that the percentage of the population that has an Internet connection decreases with the age of the respondents. Among young people (18-29 years), 98% have access to the Internet at home, among people over 60 this percentage is 86%.

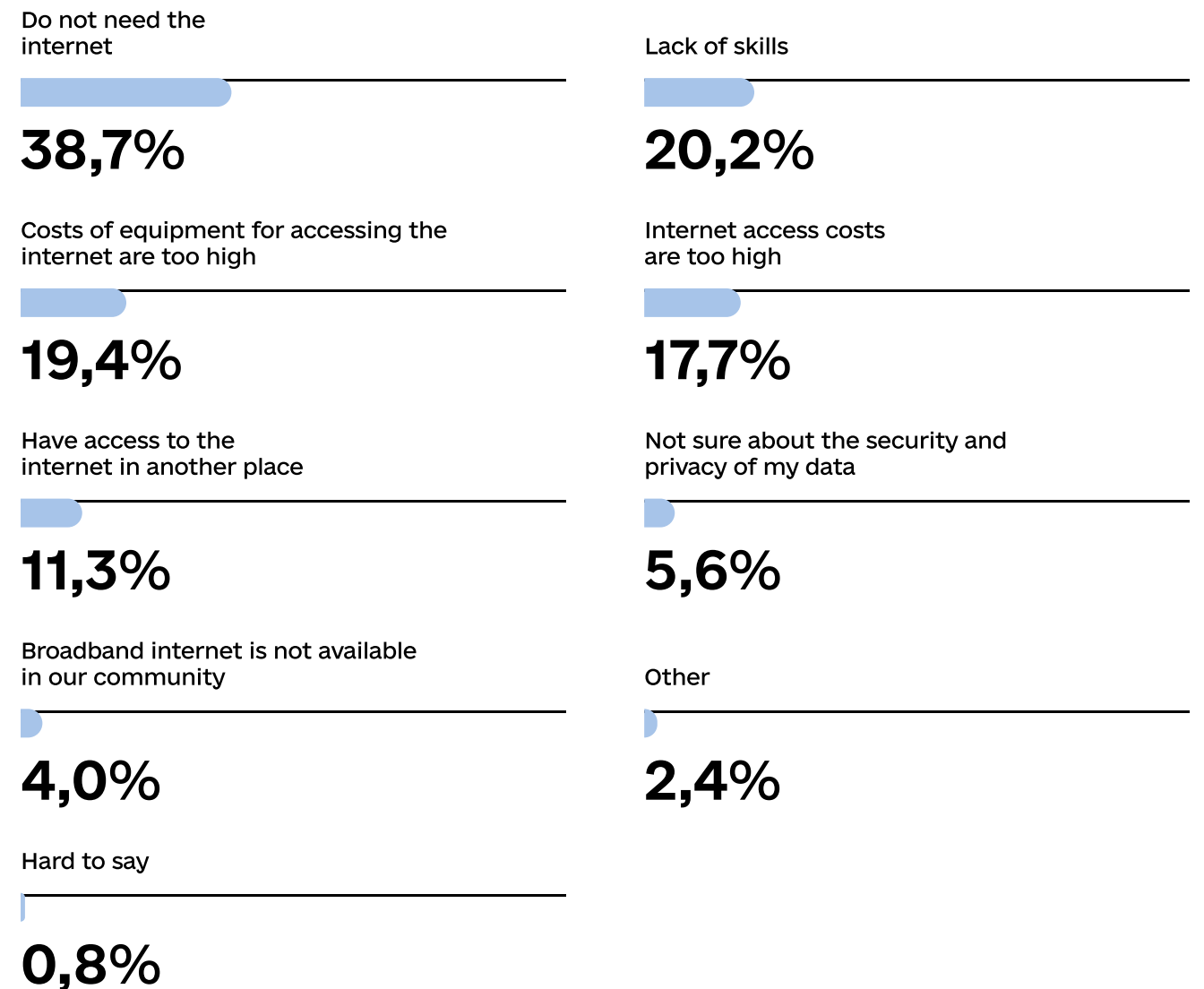
The main reasons for the lack of Internet have not changed over the past 2 years. Those who do not have access are mostly the respondents who do not see the benefit of using the Internet or do not have the appropriate skills to use it.

## Internet access at home



## Reasons for having no internet connection among the adult population

\*multiple response questions

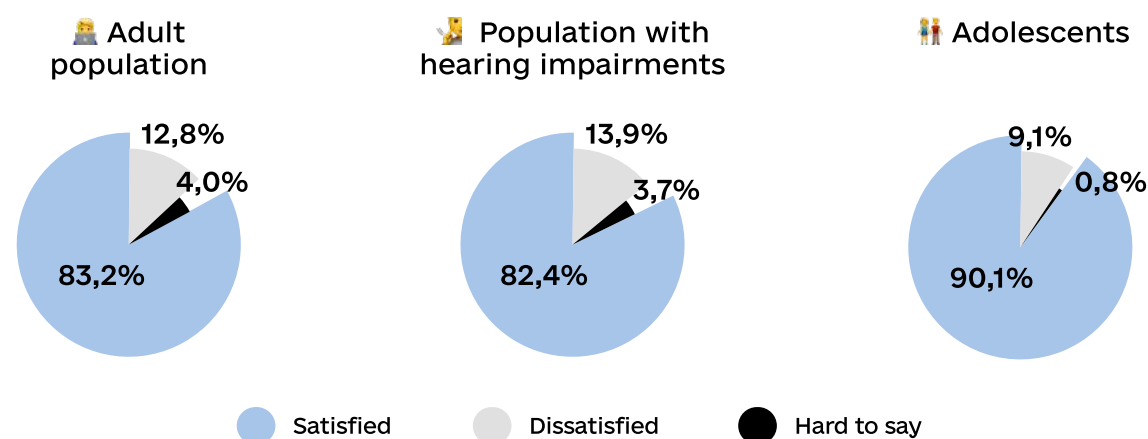


According to the national policy on electronic networks, Internet providers and mobile operators are constantly working on improving Internet coverage, increasing the speed of data transmission, which enables increasing the number of subscribers and improving their quality of life. High-quality Internet provides opportunities for uninterrupted access to various services, increasing the speed of performance of professional / educational tasks, maintaining constant communication, etc.

According to the study findings, the majority of the population of Ukraine is satisfied with the quality of the Internet in their place of

residence (from 83% among the adult population to 90% among teenagers). However, certain differences in satisfaction are observed among residents of different macro-regions of Ukraine. Notably, residents of eastern regions have the highest level of satisfaction with the quality of the Internet (87% are satisfied or mostly satisfied), and residents of the central and western regions are the least satisfied (80% and 81%, respectively). The latter have the highest proportion of dissatisfied people (16%). The place of residence also affects the reported quality of the coverage. The level of satisfaction is higher among residents of regional centers (87%) than residents of other cities and villages (80% and 81%, respectively).

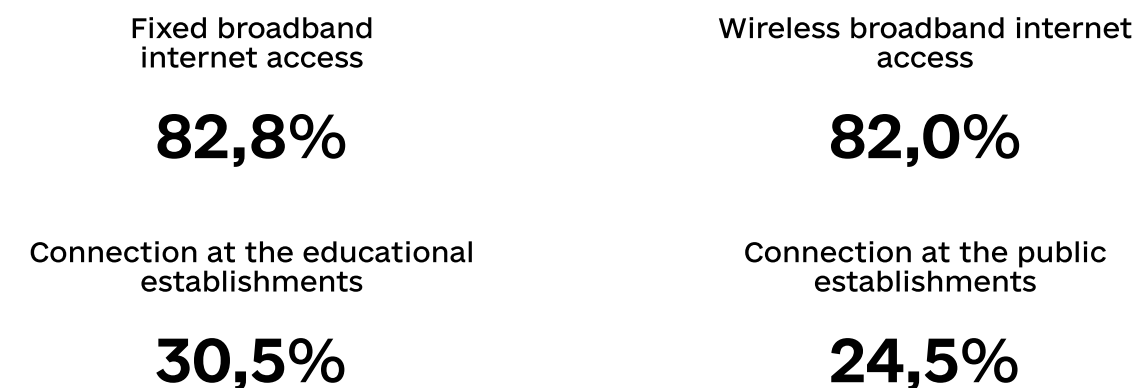
### Satisfaction with the quality of the internet



Access to the Internet has become a necessary condition for the education, because the majority of school students have to study remotely – according to the Institute of Educational Analytics, as of 15 November 2023, 25% students study exclusively online, 49% have a mixed format. According to the study findings, 95% teenagers have an Internet connection at home, and in the last week they used mobile and/or landline Internet. Almost one in three teenagers (31%) only used one type of connection – either landline or mobile connection, in equal shares. Another 37% teenagers accessed the Internet using two different types of connection. About 5% of the population aged 10–17 do not have any Internet connection and do not use it in their daily activities. The main reason for not having an Internet connection reported by the teenagers is that they do not need it.

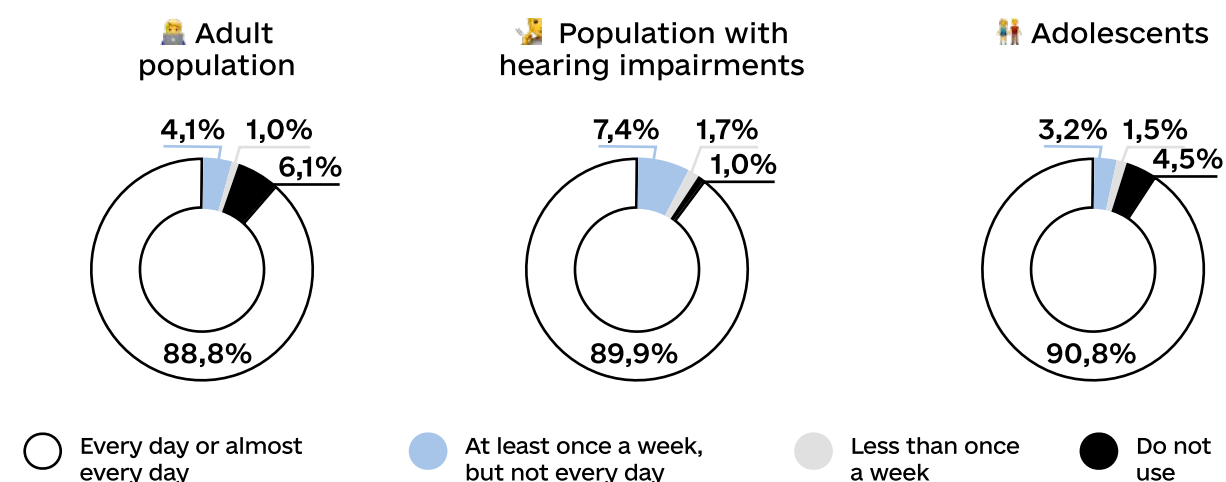
### Types of internet access among adolescents

\*Multiple response questions



Over a period of 4 years, the share of population that regularly uses the Internet has increased by 8% and in 2023 it amounts to about 94%. The frequency of Internet use practices has a direct relationship with the age of the respondents. Among the oldest category of the population, 71% respondents use the Internet daily, and among the youngest category of adults (18–29 years old), this value reaches 96%. Those who do not use the Internet at all mostly include the elderly (60-70 years old) and the population living outside the regional centers.

### Frequency of internet use in the last three months



### The amount of time people spend online among the adult population

Options	At work	At the place of study	Leisure time
Up to one hour	12,4%	17,4%	15,7%
1-3 hours	21,9%	34,7%	44,8%
4-5 hours	14,8%	12,3%	22,4%
6-7 hours	8,0%	3,9%	5,9%
8 hours and more	13,9%	4,1%	6,4%
Do not use	29,0%	27,6%	4,8%

72% respondents use the Internet as a tool for learning and self-development. It is important to note that as the age of the respondents increases, the share of those who use it for educational purposes decreases. Among young people, 14% do not use the Internet for self-development and education, and among the population aged 60+, this share is as high as 50%. This may mean that the Internet is not a convenient means for learning for older population, and that, in general, interest in learning and self-development decreases with the age of the respondents.

### The amount of time people spend online among people with hearing impairments

Options	At work	At the place of study	Leisure time
Up to one hour	20,0%	23,7%	13,5%
1-3 hours	22,0%	28,5%	26,2%
4-5 hours	13,0%	10,8%	24,3%
6-7 hours	8,0%	8,0%	11,5%
8 hours and more	17,8%	8,7%	18,8%
Do not use	19,2%	20,3%	5,7%

### The amount of time people spend online among adolescents

Options	At work	At the place of study	Leisure time
Up to one hour	9,1%	18,1%	20,3%
1-3 hours	37,8%	46,6%	40,6%
4-5 hours	25,3%	16,9%	20,3%
6-7 hours	15,4%	2,6%	7,3%
8 hours and more	10,7%	2,3%	7,8%
Do not use	1,7%	13,5%	3,7%

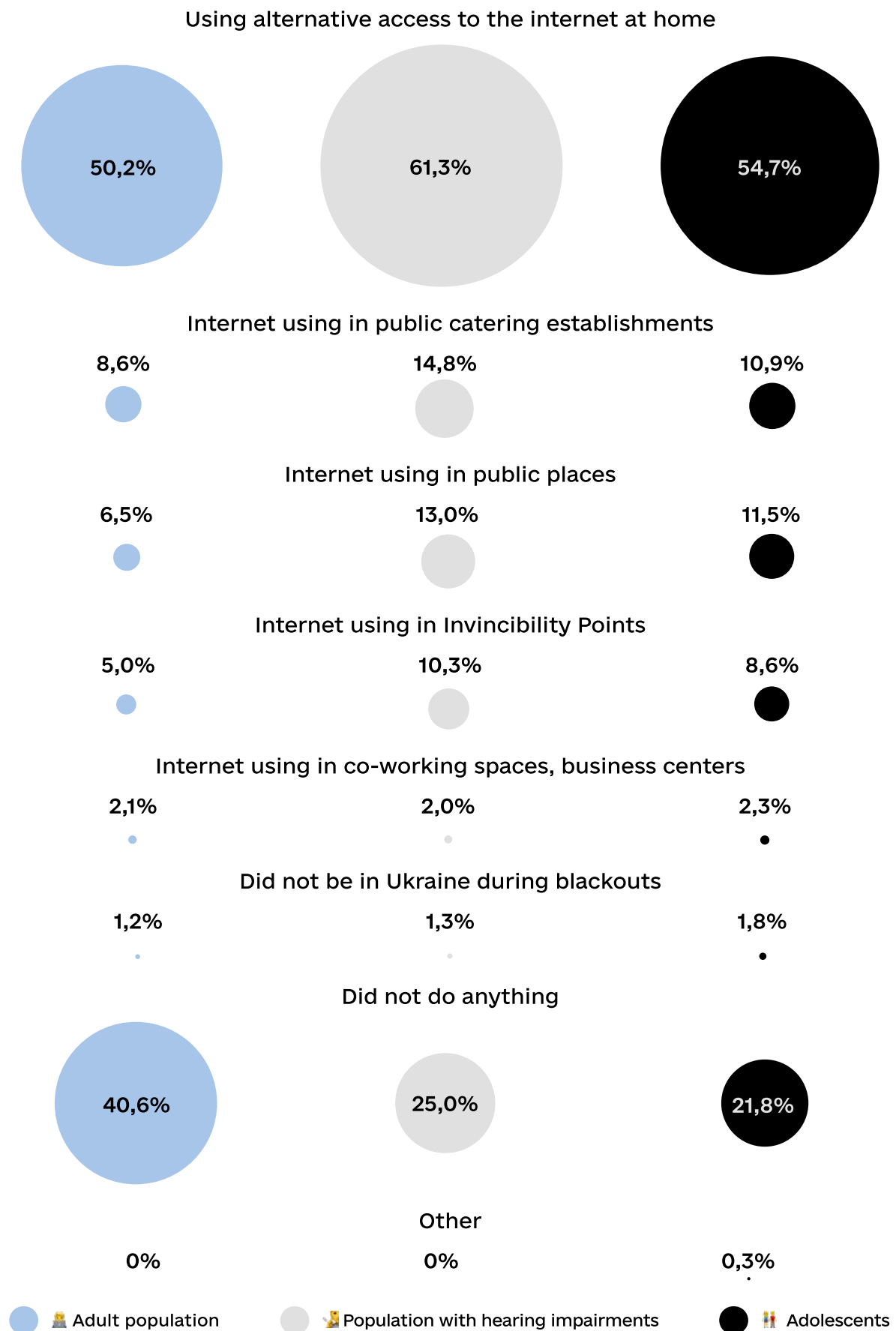
Due to constant shelling of the energy infrastructure of Ukraine, the autumn-winter period of 2022-2023 saw frequent power outages – and, as a result, a decrease in the quality of the Internet or its complete absence. It complicated the performance of both work/educational and everyday tasks of Ukrainians. Therefore, the study had a separate focus on the practice of solving this problem.

**According to the findings, almost 41% of the adult population did not take any action to access alternative Internet sources.** Among teenagers (10–17 years old) and people with hearing impairments, this percentage is lower – 22% and 25%, respectively. It is worth noting that even most of those who tried to solve the problem with Internet access preferred to stay at home and use other available technical means to get access to the Internet (distribution of the Internet through a mobile phone, portable routers, etc.). The practice of visiting public places that had electricity or alternative power sources to access the Internet was used by 2 to 9% of the adult population. Therefore, it can be assumed that in case of repetition of blackouts this year, the majority of Ukrainians will use similar practices.



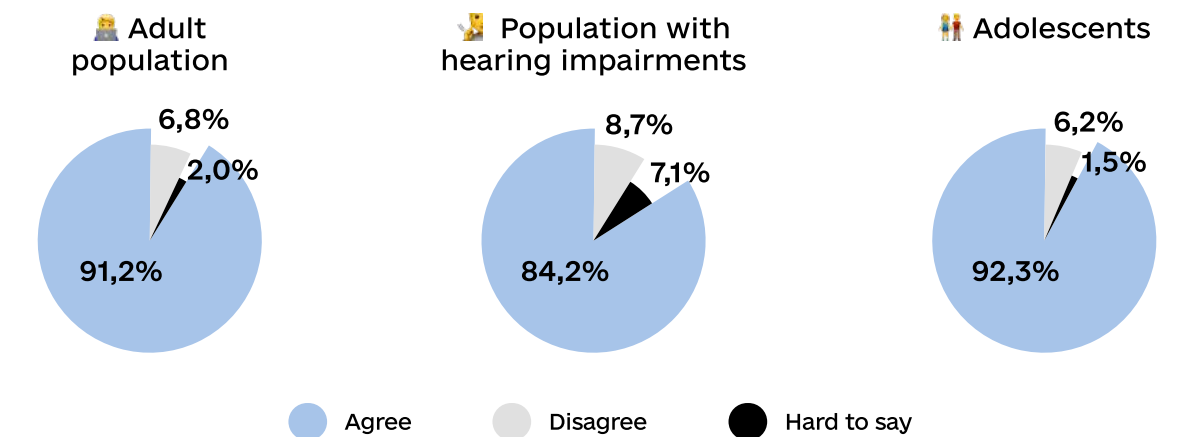
## Internet access during blackouts

\*Multiple response questions



More than 91% of the adult population and 92% of teenagers note that access to the Internet has become a necessary attribute of daily life. Among people with hearing impairments, this percentage is slightly lower – 84%. However, this group also has a bigger percentage of those for whom it was hard to tell. Although the share of supporters of the opinion that the Internet is a basic need also decreases with increased age of the respondents, even the population aged 60-70 years agrees with this statement – 86%.

### Access to the internet has become a necessary attribute of daily life



This statement was supported by the participants of the focus group discussions, regardless of age or professional group. The informants justify their answers by the fact that today access to the Internet provides many opportunities, namely:

#### Studying


Access to the network facilitates the search for necessary information, simplifies the process of establishing communication between students and teachers, etc.

«I agree with this statement. Because, for example, it would be many times more difficult to study. It would be necessary to have more paper literature. I would have to carry it with me all the time. It would also complicate communication between classmates, teachers and students. Therefore, the Internet is now a basic necessity.»

FGD, age group of adolescents 14–17 years old, f

### Adjustment of life routine


The Internet makes it easier to solve everyday problems thanks to access to the necessary information.

 «The Internet allows you to find answers to everything: how to turn on navigation, how to wash a microwave oven. You turn it on and view tips on how to do it».


FGD, age group of the elderly, f

### Communication

Informants especially note that the Internet is necessary for communication since the beginning of the full-scale invasion, because today the use of the Internet makes it possible to communicate with relatives who are in other cities, countries or in the temporarily occupied territories.

 «For me, [the Internet] is also a necessary means of communication. Yes, bank settlements and everything is just great. But this is the main means of communication with people who are abroad. With those whom there is currently no access to in the occupied territories. This is absolutely necessary now. Because there is no Ukrainian connection there at all. And only with the help of the Internet you somehow do communicate with your family, friends, and acquaintances. You learn about the situation and developments in the occupied territories. In my opinion, this is one of the most important means of communication».

FGD, professional group of teachers, m

 «I want to say that when we had no communication and no Internet, when we were de-occupied, it was very sad. You couldn't even call your relatives, find out how they are doing, you couldn't answer them, tell that everything is fine, so I'll even say that the Internet is a little more important now. When there was a connection, it was a lot of joy because we could call and talk to people. And children – they don't understand now that there is no Internet, you need to watch something, you need to watch cartoons, you need to do something, but there is no Internet – we also have TVs with the Internet now, without the Internet it does not work, and you cannot explain it to them. Without the Internet, it is very, very difficult».

FGD, age group of youth aged 27–35 years, f

### Security

The participants of the FGD noted that from February 2022, one of the important functions of the Internet is the ability to receive information on air alerts, the situation on the frontline and other issues related to security.

### Access to goods and services

Notably, the participants of the discussions noted that today the use of the Internet simplifies the process of ordering medicines, clothes, food, etc.

Regardless of the area of Internet usage, its main advantage reported by the participants is about access to information, thanks to which all the above-mentioned aspects become possible. The data show that today in Ukraine, about 95% residents have the opportunity and practice of using the Internet. The Internet has become an essential part of the lives of most Ukrainians, and they perceive the need for constant access and use of the Internet as their basic need. The Internet entering into all areas of life, such as work, self-development, leisure, etc., becomes a solid basis for the development of digital skills of every resident of the country.

Section

# 2

## Digital skills of the population



# Digital skills of the population

This section highlights the dynamics related to the development of digital skills in the population starting from 2019 and illustrates current situation with digital literacy of target groups such as the adult population of Ukraine (18–70 years old), adolescents (10–17 years old) and people with hearing impairments (18–59 years old).

In addition to measuring digital literacy according to the adapted DESI framework, to assess the dynamics, respondents of all categories were asked to independently assess of changes in their own digital skills over the past year. The findings of self-assessment are provided in the subsection Self-assessment of changes in digital skills over the past year by different target groups. This section also includes the findings that demonstrate the Practices of using artificial intelligence by different target groups.

For a more in-depth understanding of the context in which digital skills are developed, the findings of the survey are triangulated with the conclusions from the focus group discussions. For holistic reporting, these components are interwoven within the content structure. The subsections may contain direct quotes from informants.

## General level of digital skills, by target groups

### 👤 Adult population (18–70 years)

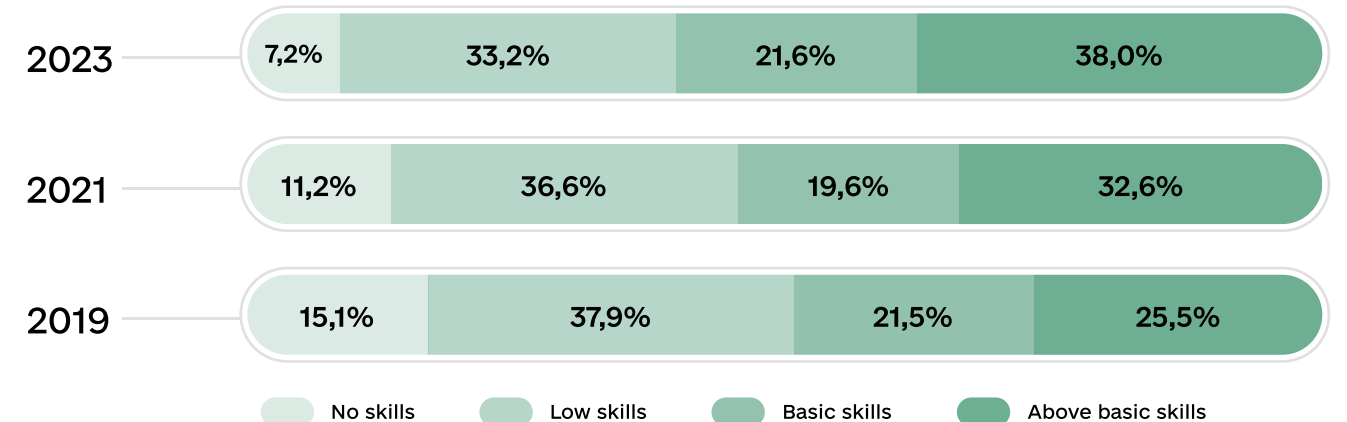
According to the findings of the 2023 study, 93% of the population of Ukraine have some digital skills. Over 4 years, the share of people without digital skills decreased by 8% (decrease from 15% in 2019 to 7% in 2023). The positive trend of an increase in the share of the

population with digital skills indicates the steady development of digital literacy in the country. In addition to improving quantitative indicators, we observe the improvement of digital skills. The share of people with above basic digital skills increased by 12% compared to 2019, reaching 38%.

### Levels of digital skills

No skills	No digital skills in all four areas (information, communication, problem solving, digital content manipulation) and/or have not used Internet services in the last 3 months
Low skills	No digital skills in one of the four competence areas
Basic skills	Level of digital skills in all four areas is at least basic
Above basic skills	The level of digital skills in all four areas is at least above basic

### 👤 Dynamics of digital skills assessment among the adult population



**Reduction of the percentage of population that have no digital skills from 2019 to 2023 is linear – every wave of studies shows a decrease in the share of population with no skills by 4%.** To a greater extent, it is explained by demographic processes – natural movement of the population. That is, the share of middle-aged people – who have higher digital skills – gradual moves into the older age category. In the graph, we can see how the reduction in the proportion of the population without skills correlates with the increased respondent age.

<sup>2</sup> – Here and hereafter, the level of digital skills is calculated only for individuals who have used the Internet in the previous 3 months. Those who do not have an internet connection or have not used its services are automatically categorized as having "no skills" because it is assumed that they lack the necessary skills.

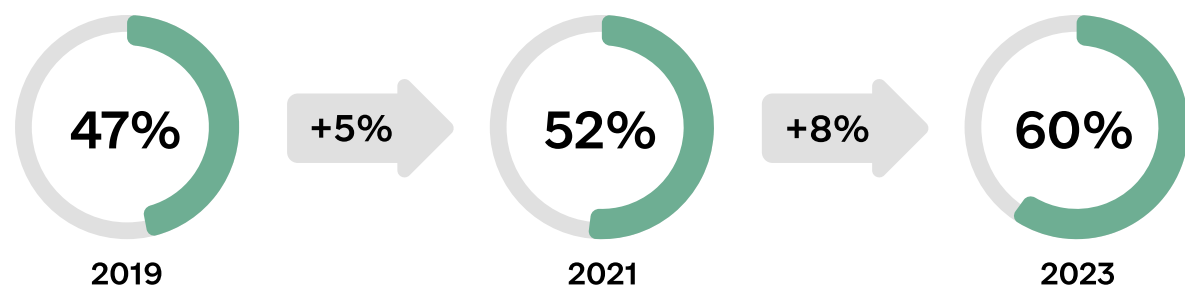


### 👤 Dynamics of share of the people with No Digital skills by age groups

Options	2019	2021	2023
18-29 years old	1,1%	0,9%	2,1%
30-39 years old	3,8%	2,8%	3,1%
40-49 years old	9,7%	6,8%	5,8%
50-59 years old	19,2%	14,6%	8,9%
60-70 years old	46,7%	33,2%	17,4%
<b>Total</b>	<b>80,5%</b>	<b>58,3%</b>	<b>37,3%</b>

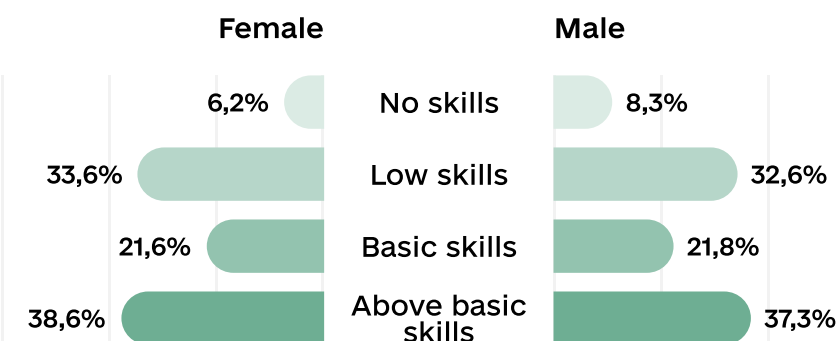
56% respondents aged 18–70 report that their digital skills have improved over the past year. However, it cannot be argued that a full-scale invasion affected the digital literacy of the population more than the coronavirus pandemic.

### 👤 Dynamics of share of the people with Basic and Above basic skills among the adult population



Similar to previous waves, young people are the most digitally literate, and as respondent age increases, the proportion of people with digital skills decreases.

### 👤 Overall digital skills assessment among the adult population by gender



### 👤 Overall digital skills assessment among the adult population by age groups

Digital Skills Level	18-29 years old	30-39 years old	40-49 years old	50-59 years old	60-70 years old
No skills	2,1%	3,1%	5,8%	8,9%	17,4%
Low skills	13,3%	24,0%	32,6%	42,5%	56,7%
Basic skills	19,2%	28,8%	21,9%	22,5%	13,9%
Above basic skills	65,4%	44,1%	39,7%	26,1%	12,0%

In addition to age, we observe differences in the digital skills of the population by the parameters such as:

- 👤 **educational background** – the digital skills of people without vocational or higher education are lower than those of people with secondary special education, and the latter are inferior in skills to people with incomplete higher / higher education or a scientific degree;
- 👤 **type of employment** – students and the employed population have better digital skills than unemployed people, especially pensioners / unemployed due to health conditions;
- 👤 **financial status** – people with higher incomes have higher levels of digital skills.

**👤 Overall digital skills assessment among the adult population by educational level**

Options	Incomplete / complete secondary education	Secondary special education	Incomplete higher / higher education
No skills	13,3%	69,4%	3,6%
Low skills	46,3%	46,2%	18,9%
Basic skills	16,3%	22,1%	23,0%
Above basic skills	24,1%	22,3%	54,5%

**👤 Overall digital skills assessment among the adult population by employment status**

Digital Skills Level	Working people	Students	Non-working population	Senior citizens / unemployed due to health conditions
No skills	4,5%	3,2%	8,7%	19,1%
Low skills	27,1%	5,4%	38,6%	63,7%
Basic skills	24,5%	10,8%	23,9%	10,9%
Above basic skills	43,9%	80,6%	28,8%	6,3%

Correlation between the level of income and digital literacy is also observed in absolute numbers. The trend is confirmed: **as the level of skills increases, the personal average monthly income increases, too.** However, the question about the income is of a delicate nature – the percentage of refusals to answer this question is 31%. In addition, the share of refusals is higher among students (56%) and citizens who are temporarily unemployed (47%), which can be connected both with shadow employment practices and simply with the reluctance to report real income. In other words, it is difficult to predict how the figures of average monthly income would change with an increase in the percentage respondents who would answer this question.

**👤 Overall digital skills assessment among the adult population by income**

Digital Skills Level	Below average income	Average income	Above average income
No skills	13,4%	4,1%	3,3%
Low skills	46,6%	29,9%	14,7%
Basic skills	16,7%	23,0%	28,2%
Above basic skills	23,3%	43,0%	53,8%

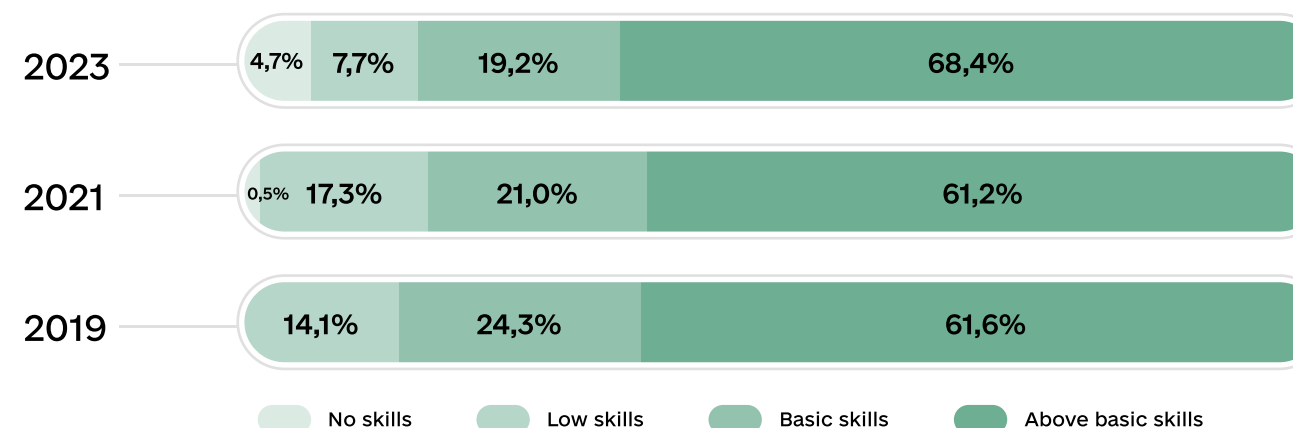
**General level of digital skills, by target groups**

**👤 Teenagers (10–17 years old)**

Compared to the adult population, the share of teenagers with a level of digital skills above basic (basic skills + above basic skills) is stable. In 2019, 86% teenage respondents had such skills, and now it is 88%. At the same time, there is a flow within the group – the share of teenagers with basic skills decreases, and the share of teenagers with above basic skills increases.

The share of adolescents with no digital skills in 2023 is almost 5%, although in 2019 and 2021 this value was almost zero. Currently, we cannot talk about regression, because the change in the value is not statistically significant.

**👤 Overall digital skills assessment among adolescents**



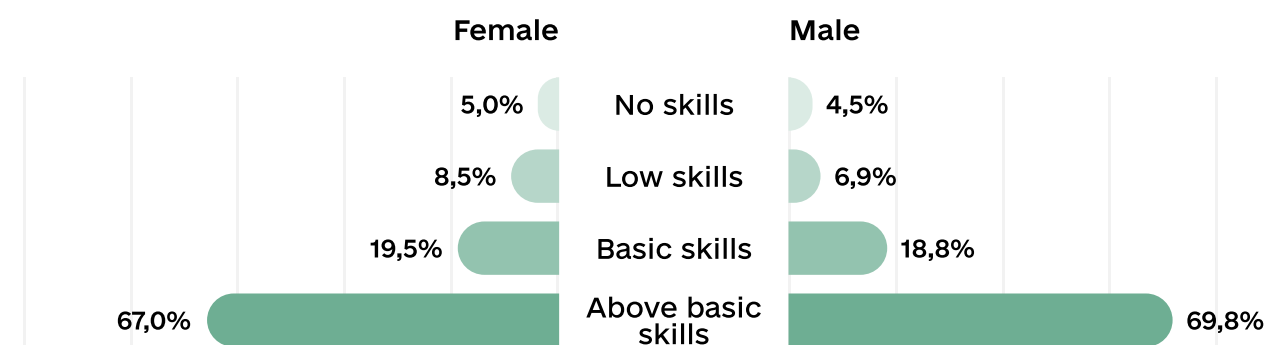
Similar to adults, age is a stronger factor influencing skill level than sex of the respondent. In addition, **the number of children in the family affects the digital literacy of teenagers.** Notably, teenagers who are one child in the family have better digital skills than those who are brought up in families with two or more children. In addition, the increase in the number of siblings is associated with increased percentage of teenagers with no digital skills.

Among the respondents who are the only child in the family, the percentage of teenagers with no skills is 3%. Among those who have one sibling, it is 5%, and among those who have 2 or more siblings, almost 9%. This may be due to the fact that when a child is alone in the family, they receive more attention from their parents, so they have more opportunities to learn from them and have better access to digital technologies – they do not have to share gadgets with anyone – unlike in large families, where this is a common practice. In particular, the findings of the 2021 wave about distance education practices among teenagers indicated that among those with a sibling, 57% faced a situation where someone lacked a device with Internet access to attend classes online.

#### 👤 Overall digital skills assessment among adolescents by age groups

Digital Skills Level	10-12 years old	13-15 років	16-17 років
No skills	4,5%	4,7%	5,1%
Low skills	13,5%	4,7%	3,0%
Basic skills	25,8%	16,9%	12,1%
Above basic skills	56,2%	73,7%	79,8%

#### 👤 Overall digital skills assessment among adolescents by gender

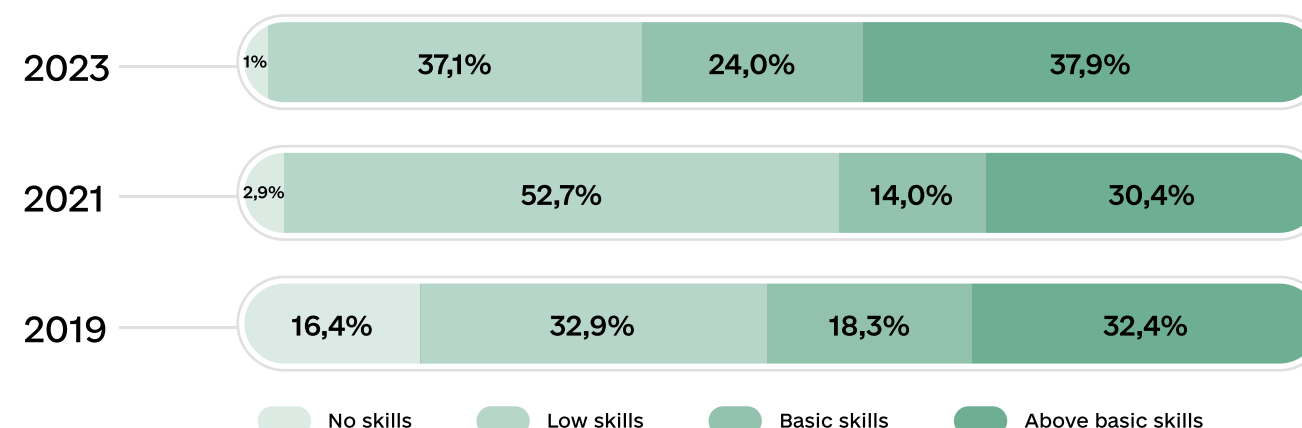


#### General level of digital skills, by target groups

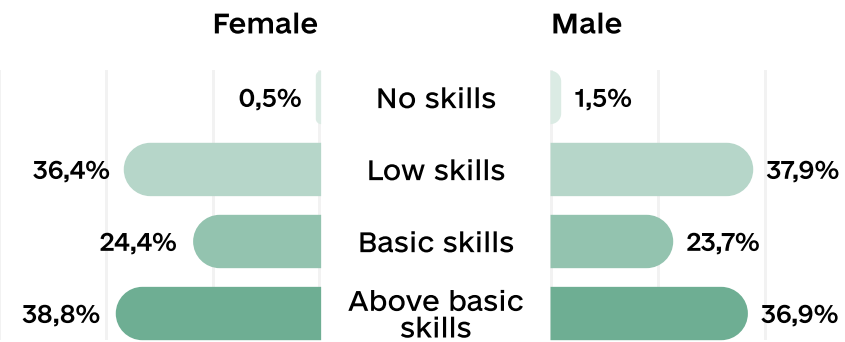
##### 👤 People with hearing impairments (18–59 years)

Data collection among people with hearing impairments was organized by self-completion of an electronic questionnaire. **Over four years, the share of those with no digital skills decreased by 15%, and of people with above basic skills, increased by 7%.** Comparing these data with similar values among the adult population prompt us to conclude that the inclusion of people with hearing impairments in digital practices occurs faster, but the development of these skills – the in-depth use of digital skills – is slower.

#### 👤 Overall digital skills assessment among people with auditory disabilities



### 👤 Overall digital skills assessment among people with auditory disabilities by gender



### Dynamics of digital skills, by areas of competence

Information and communication skills involve a somewhat simpler list of operations than problem solving skills or digital content manipulation skills. For example, reading the news reports and instant messaging is an information and communication skill, while using Internet banking is a problem solving skill, and working in MS Office involves creating digital content.

Therefore, it is quite logical that among the adult population, the share of those who possess informational (91%) or communication (91%) skills is the largest, and the share of those with digital content manipulation skills is significantly lower (60%). On the one hand, this may be due to the fact that the latter area of competence is not relevant for part of the respondents – digital content manipulation skills do not provide clear advantages, and therefore, the motivation to master them is lower. On the other hand, the process of development of these skills is more complicated – it requires more time and effort.

### Indicator of digital skills in 2023 by target groups and areas of competence

\*for basic and above basic skills

Target group	Area of digital competences			
	Informational skills	Communication skills	Problem solving skills	Digital content manipulation skills
👤 Adult population	91%	91%	86%	60%
👦 Teenagers	93%	95%	94%	88%
👤 People with hearing impairments	96%	98%	94%	63%

94% people with hearing impairments report having problem solving skills. This is 8% more than among the adult population. In particular, people with hearing impairments use digital tools to solve problems almost at the same level as searching for information or communicating online. This may mean that this target audience faces certain difficulties offline – for example, when using bank services or purchasing goods. Therefore, digital skills contribute to increased accessibility of online services. Among teenagers, almost the same share of respondents has certain level of skills in various areas of competence. The difference between the most and least popular skill types is 7%. This suggests that the teenagers have better integrated digital technologies into all life processes.

The graphs present the digital skills of the target groups by competence areas, broken down by proficiency levels. They show that among adults, problem solving skills and digital content manipulation skills are not only less common, but also more superficial, compared to information and communication skills.



**No skills** Did not use any of the skills in the last 3 months

**Basic skills** Used one skill in the last 3 months

**Above basic skills** Used more than one skill in the last 3 months

### Digital skills assessment among the adult population, 2023

Варіант відповіді	Information skills	Communication skills	Problem-solving skills	Digital content creation skills
No skills	9,1%	8,7%	13,8%	39,8%
Basic skills	4,8%	3,4%	25,0%	19,0%
Above basic skills	86,1%	87,9%	61,2%	41,2%

### Digital skills assessment among people with auditory disabilities, 2023

Варіант відповіді	Information skills	Communication skills	Problem-solving skills	Digital content creation skills
No skills	3,5%	2,0%	5,7%	37,4%
Basic skills	4,7%	1,2%	24,3%	21,3%
Above basic skills	91,8%	96,8%	70,0%	41,3%

### Digital skills assessment among adolescents, 2023

Варіант відповіді	Information skills	Communication skills	Problem-solving skills	Digital content creation skills
No skills	7,2%	5,0%	5,8%	11,7%
Basic skills	7,2%	1,7%	11,4%	9,7%
Above basic skills	85,6%	93,3%	82,8%	78,6%

### Dynamics of digital skills assessment among the adult population by area of digital competencies

	2019	2021	2023
<b>Information skills</b>			
No skills	18,6%	15,9%	9,1%
Basic skills	6,9%	5,1%	4,8%
Above basic skills	74,5%	78,9%	86,1%
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>
<b>Communication skills</b>			
No skills	19,1%	15,6%	8,7%
Basic skills	5,6%	5,2%	3,4%
Above basic skills	75,3%	79,2%	87,9%
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>
<b>Problem-solving skills</b>			
No skills	20,1%	17,4%	13,8%
Basic skills	24,3%	26,7%	25,0%
Above basic skills	55,6%	55,8%	61,2%
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>
<b>Digital content creation skills</b>			
No skills	52,2%	45,6%	39,8%
Basic skills	19,0%	17,7%	19,0%
Above basic skills	28,8%	36,8%	41,2%
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

## Key changes in the practices of using digital skills among Ukrainian adults

1

In 4 years, the share of Internet banking users among the adult population increased from 55% in 2019 to 80% in 2023.

2

In terms of using software for content editing (photos, video or audio files), an increase in the share of users by 19% (from 26% to 44%) was recorded.

3

The relevance/need of online learning for adults is increasing. The increase in users of educational websites/portals from 2019 to 2023 is 18%. In 2023, the share of users is 28%. Also, the use of educational materials on the Internet increased by 15% (from 21% to 36%).

4

The practice of using digital technologies in public and political life is becoming more common. Participation in online consultations or voting on certain social or political issues (for example, signing a petition) increased by 15% – from 20% to 35%. The same increase was recorded in terms of activity in social networks – posting on social and/or political topics (in 2023, the value is 46%). The practice of using the Internet in social and political life could be influenced by the war – notably, volunteering practices and paying tribute to heroes by signing electronic petitions, etc. are becoming more prevalent.

## 👥 Dynamics of digital skills assessment among adolescents by area of digital competencies

	2019	2021	2023
<b>Information skills</b>			
No skills	7,3%	4,9%	7,2%
Basic skills	16,6%	16,8%	7,2%
Above basic skills	76,1%	78,3%	85,6%
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>
<b>Communication skills</b>			
No skills	7,3%	6,8%	5,0%
Basic skills	6,5%	4,4%	1,7%
Above basic skills	86,2%	88,8%	93,3%
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>
<b>Problem-solving skills</b>			
No skills	0%	1,5%	5,7%
Basic skills	11,7%	18,0%	11,4%
Above basic skills	88,3%	80,5%	82,8%
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>
<b>Digital content creation skills</b>			
No skills	7,3%	11,5%	11,7%
Basic skills	6,5%	11,5%	9,7%
Above basic skills	86,2%	77,0%	78,6%
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

## Key changes in the practices of using digital technologies among teenagers

1

**Distance education experience.** In terms of the 4-year dynamics, the biggest changes in the practices of using the Internet by teenagers are related to online learning. 83% respondents now have this experience, and the increase from 2019 is 42%. 74% respondents (+49%) had the practice of interacting with teachers using educational websites or portals, and 48% adolescents use online courses in 2023, which is an absolute increase compared to 2019. Such drastic changes are a consequence of the coronavirus pandemic. In terms of comparing the experience of online education, interaction with teachers through electronic portals and taking online courses in 2021 and 2023, the increase has slowed down significantly (from 6% to 9%, depending on a parameter).

2

**Teenagers became more interested in news reports.** The share of respondents who read online news websites, magazines or newspapers has increased by 19% over the past two years (from 47% to 63%). This may indicate that the teenagers are concerned about the events in Ukraine and follow the developments.

3

**Messengers are becoming an integral tool of communication among teenagers.** The share of users making calls and instant messages in messengers (Skype, Messenger, WhatsApp, Viber, Telegram, Signal , etc.) increased by 15%. 96% teenagers communicate through messengers, and 94% make calls.

4

**The share of Internet banking users increased by 14% to 49%.**

5

**Among teenagers, the popularity of software for content editing (photos, videos, or audio files) is decreasing.** The share of users of such software

has decreased by 27% in 4 years and in 2023 amounts to 46%. This needs further study. A possible reason is that the social networks used by children already have these options embedded and there is no need in additional software, or editing of photo/video/audio files in general has been superseded by other digital trends.K

## Dynamics of digital skills assessment among people with auditory disabilities by area of digital competencies

	2019	2021	2023
<b>Information skills</b>			
No skills	22,4%	10,1%	3,5%
Basic skills	5,9%	37,2%	4,7%
Above basic skills	71,7%	52,7%	91,8%
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>
<b>Communication skills</b>			
No skills	17,4%	42,1%	2,0%
Basic skills	2,7%	0,3%	1,2%
Above basic skills	79,9%	57,6%	96,8%
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>
<b>Problem-solving skills</b>			
No skills	24,7%	6,3%	5,7%
Basic skills	13,2%	46,7%	24,3%
Above basic skills	62,1%	47,0%	70,0%
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>
<b>Digital content creation skills</b>			
No skills	34,2%	18,3%	37,4%
Basic skills	16,9%	17,5%	21,3%
Above basic skills	48,9%	64,2%	41,3%
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

## Key changes in the practices of using digital technologies among people with hearing impairments

1

**Social and political activity of people with hearing impairments on the Internet has increased.** The share of users of electronic democracy tools increased by 30% – from 24% in 2019 to 54% in 2023. That is, the rate of participation in online consultations or voting on certain social or political issues (for example, signing a petition) increased more than twice.

2

**Information skills become stronger** – the share of people with hearing impairments who use more complex operations is increasing. Notably, the share of respondents who have experience submitting electronic forms on the Internet increased by 29% (from 21% to 50%). The rate of downloading/printing official forms (from 13% to 38%) and receiving information from applications/websites (from 30% to 55%) also increased drastically. In general, the combination of these three operations and their proportional dynamics can indicate not only the improvement of these skills, but also expanded possibilities of their application – for example, public online services become more accessible for people with hearing impairments.

3

**Internet banking is gaining popularity among this target group as well.** The share of banking users on a computer or smartphone increased by 19% from 70% in 2019 to 89% in 2023.

4

**The role of digital technologies for people with hearing impairments in the workplace is also increasing.** Notably, in 4 years, the share of respondents who use the Internet to search for a job or send a resume has doubled (from 16% to 32%). Also, 51% respondents search for information about work, which is 15% more than in 2019.

5

**Online learning is becoming more popular.** The share of respondents who have experience communicating with teachers or students using educational websites/portals increased by 15% from 13% in 2019 to 28% in 2023.

According to the participants of the focus group discussions, **these are individuals (regular people) who are responsible for developing their digital literacy.** Informants agree that having certain digital skills today is mandatory for successful self-fulfillment and ease of life. At the same time, the level of digital skills of an adult is still not as important as professional competence or experience. For the most part, **this is the need/request for digital skills that can trigger the development of digital competences.** This is what motivates adults to learn new skills in ICT.

**The specifics of the development of digital literacy among children and tertiary students are somewhat different.**

First of all

**Digital skills for them are a tool of their main activity – education,** given the practices of distance education in recent years due to the coronavirus pandemic and the war. It is implied that learning involves the use of certain digital technologies. While the adults also use ICT to perform work tasks, it is fair to say that the adolescents learn new things faster and easier. Therefore, the use of gadgets, the Internet, various software in school education is a good foundation for strengthening digital competences in the future.

Secondly

**Digital technologies are already an integral part of young people's lives** – we can prove it by their higher values of digital literacy compared to adults, especially when it comes to problem solving digital skills. Notably, 86% adults (18–70 years old) and 95% teenagers aged 16–17 have such skills and use ICT to perform certain regular tasks. The youngest category of adults, people aged 18–29, demonstrate even greater involvement in these processes – 98% of them have skills to solve problems using digital technologies.

Regardless of the areas of digital competence, the patterns of how factors such as age, educational background, employment, financial situation impact the level of digital literacy are the same.

Next, the study findings for each area of digital competence are described.



## Self-assessed changes in digital skills in last year, by target groups

56% Ukrainian adults and 59% people with hearing impairments report an improvement in their digital skills during the last year, and among teenagers, this value is 73%.

The proportion of people who see positive changes in their digital skills increases as digital literacy levels improve. For example, in the age group of 18–70, 46% of those with low skills report improved skills. The same is reported by 59% adults with basic skills and 69% adults with above basic skills. A similar trend is observed among young people: 55% young people with low skills, 63% with basic skills and 80% with above basic skills report improved skills. **This indicates a trend: the higher the level of digital skills, the more likely an individual is to develop/improve their digital skills.**

### Digital skills assessment by target groups in 2023

Options	👤 Adult population	👤 Population with hearing impairments	👤 Adolescents
Digital skills were increased	56,3%	58,7%	73,1%
Without changes	37,9%	23,0%	20,9%
Digital skills were decreased	1,7%	2,5%	3,5%
Hard to say	4,1%	15,8%	2,5%

### The share of people who see progress in their digital competences in the last year is higher among the following population groups:

- 👤 tertiary students and the employed population;
- 👤 younger people – among adult population, these are 18-29-year-olds, and among people with hearing impairments, up to 35 years old;
- 👤 people with incomplete higher or higher education;
- 👤 people with a level of income above average.

On the one hand, this reinforces the conclusion about the importance of social conditions for the development of digital skills, and on the other hand, it indicates the dynamic nature of the processes – acquired skills may need improvement.

When discussing the main advantages and disadvantages of developing digital skills, the FGD informants highlighted both the expected consequences of digitalization (for example, saving time, increased availability of goods/services, convenience, etc.) and the insights that require more attention, such as the feeling of losing control over personal data or the decentralized development of national digital resources, which makes the users confused.

### So, obvious advantages of the development of digital technologies are:

- 👤 **It saves time** – it is one of key advantages of digitization, because the use of digital technologies enables reducing the time necessary to perform certain professional or household tasks.
- 👤 **Increased availability of goods / services.** FGD informants note that access to the Internet enables entrepreneurs to expand their target audience to promote their goods and services, while consumers have the opportunity to choose the best offer for themselves.

👤 «Online stores are also popular now. The same product may be available in the offline store, and you can also try to sell it via the Internet, that is, if the weather is bad there, there are very few people on the street who come [to the offline store], except for the older generation. And the youth, they are all already focused on shopping on the Internet».

FGD, age group of youth 27–35 years old, f

### 👤 A variety of available sources for obtaining necessary information

👤 «And I will say that the Internet is everything for me. Because you can find any information there. You want an artist – you google and found all the information. You want a song – you found it. Some diagnosis, some disease to read about – you found it. You found the cure. You found the drug. I do lessons with my child – here, too, the Internet is indispensable. In older times, you would go to the library, but now you can find everything on the Internet».

FGD, professional group of doctors, f

Also, this advantage is noted by teachers, because for them using digital technologies in work is an additional opportunity to diversify the teaching process.

«And the advantages are that it diversifies our work. What would our work be now if there were no digital technologies? Of course, the role of digital technology is constantly changing in our world. It gives flexibility in our knowledge – we can use an educational video from YouTube, or a video for a short workout during the break . Different sources, different platforms, sample tests. We teach children, of course, to be flexible to changes, to adapt easily».

FGD, professional group of teachers, f

**Improved quality and comfort of life.** Participants associate this advantage with the simplification of many household processes, starting from buying products and ending with receiving various public services.

## Practices of using the artificial intelligence, by different target groups

Almost one in three adults (31%) use artificial intelligence for work, self-development or leisure. The better digital skills citizens have, the more likely they are to use AI. Among people with hearing impairments, the share of AI users is 40%. Young people aged 10–17 integrated the use of AI into their lives even better – among them, two in three respondents, or 67%, have experience using artificial intelligence.

### Practices of using the artificial intelligence

Options	👤 Adult population	👤 Population with hearing impairments	👤 Adolescents
Work / Studying	15,8%	21,5%	56,3%
Self-development	21,8%	26,8%	54,9%
Leisure	25,1%	31,8%	57,8%

**One in four adults (25%) have experience using AI for fun, while one in six (15%) have used it for work.** Among people with hearing impairments, the share of users, regardless of the purpose, is higher, but the trend remains – it is more of a tool for entertainment than for work.

During the focus group discussions, the informants noted that on the one hand, to use the AI effectively, the users have to set tasks correctly, and on the other hand, up-to-date and accurate information is available in paid versions. And if the former is about the level of skills, the latter is about realizing the value of the tool, because currently AI is not perceived as an information service that must be paid for.

The FGD informants use the potential of artificial intelligence to find answers to simple questions, perform routine tasks, as well as for creativity.

## An example of using AI to find answers

«I usually use Chat GPT to just find out some answer to some question – when I have something in mind but I'm not 100% sure. I check in several sources and works. I don't ask Chat GPT. Once I asked just like that for research, and it replied with such an off-topic message. Therefore, I write works myself. I even like to write it and I quickly do it. But most often, I ask an option of an answer. We had a task at school – we had to distribute the values by columns. I did not understand this topic well. And it distributed everything to me. And his answer was correct. So, I use this chat in such cases».

FGD, age group of adolescents 14–17 years old, f

Since the use of artificial intelligence by the selected target groups has not yet become an everyday practice, **the benefits of using various services reported during the FGDs are of a generalized nature:**

1

**It saves time.**

2

**It saves own resource.** The use of AI makes it possible to refocus on tasks that require greater involvement and creativity, without wasting energy on routine tasks.

3

**Ability to get the necessary information in a concise format,** without being distracted by contextual advertising while using various websites.

«And one more feature, and it can also be attributed to saving time, but there are no ads when you search for information and you do not have to filter this information, for example, type... a request in the Google search service, you need to find the websites you need, because now there a ua mark – like what we need, what we don't need, right? And the websites have a lot of ads – that's yet more unnecessary information for our brains.».

FGD, professional group of employees of local self-government bodies and MOEs, m

The reported benefits are quite obvious. At the same time, some of the discussions during the FGDs provide clearer picture on how the public really perceives artificial intelligence – what are prejudices, stereotypes and fears.

**According to the participants of the FGDs, the main risks of the AI development are:**

01

**Artificial intelligence will lead to structural changes in the economy – technology will replace people.**

According to FGD participants, the automation of various work tasks can reduce the need in human employees. If no re-qualification programmes are launched to employ people in other sectors, the AI development can negatively affect the level of unemployment in the country and the quality of life of a part of the population.

«On the one hand, some professions, some specialties, some job positions can be integrated immediately, they can be replaced by artificial intelligence, maybe not completely, but for 80 percent. Other tasks can be entrusted to someone else, to an employee who will not do it for a long time».

FGD, professional group of employees of local self-government bodies and MOEs, m

«I heard somewhere in the news reports that people were simply fired and replaced by Chat GPT and other artificial intelligence. People are fired, they stay without work, they are replaced by artificial intelligence».

FGD, age group of adolescents 14–17 years old, m

02

**The use of AI will make people lazy and deprive them of critical thinking.  
Reply.**

By delegating more and more tasks to artificial intelligence, an individual may lose the desire to perform some duties or operations on their own.

«I believe that the abuse of artificial intelligence has negative consequences. Because a person no longer works independently. They do not develop any logical thinking, creativity, etc. The person rewrote the answer and that's it. In our life, we have to be able to analyze everything, to think, to create some ideas. With the help of the artificial intelligence, this is not always possible. Unless a person fully experienced what was written there. But this is not always the case».

FGD, age group of adolescents 14–17 years old, m

«I would like to add that about the GPT chat I have a little fear that I would stop thinking if I used it often and so on, but in order to use that chat, you even need to be able to ask questions correctly, to make requests. To properly explain to artificial intelligence what you want from is quite an interesting job to do. Even when I look for job, I see a lot of vacancies where some knowledge of IT technologies is required, some knowledge of how to use the GPT chat, not even this free version, but this paid version, because there are more opportunities there».

FGD, age group of youth 27–35 years old, f

**It is worth noting that currently the AI does not enjoy a high level of user trust and is not perceived as software that is worth paying for.**

- **Mistrust due to insufficient level of reliability and accuracy of information.** Namely, errors in algorithms and limited access to information can make the AI provide wrong answer to the question.
- **Artificial intelligence is currently NOT perceived as an information service worth paying for.**

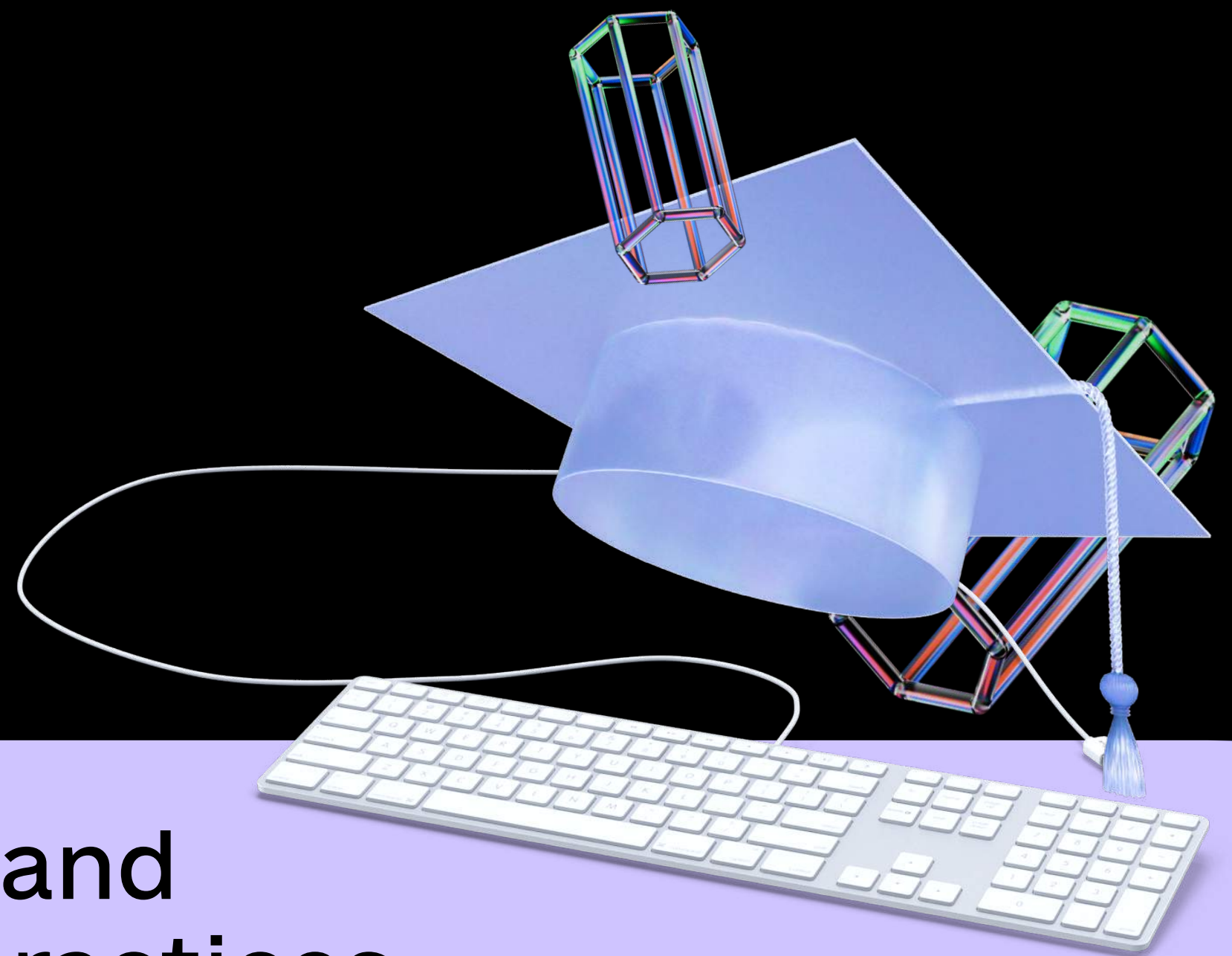
«As the free version of GPT chat, it has data until 2021, so all the data we need beyond that is already in the paid version. Paid version, to be paid from own pocket».

FGD, age group of youth 27–35 years old, f



Section

# 3



## Self-development and online education practices

This section focuses on the analysis of self-education practices (notably, regarding digital skills), measuring awareness and use of Ukrainian educational platforms (in particular, products of the Ministry of Digital Transformation such as Diia.Osvita and Digital Education Hubs) among target groups such as adult population of Ukraine (18–70 years old), teenagers (10–17 years old) and people with hearing impairments (18–59 years old).

## Practices of online education

In the modern information society, self-education becomes a necessary component of successful and sustainable development of each individual. Increasing access to technology and Internet resources expands opportunities for learning anytime, anywhere. Ukraine does not remain aloof from this trend. The trends of active use of various platforms for self-education by the population and of the development of its own market for educational services, in particular online, are documented in Ukraine.

According to the study findings, from 17% to 43% respondents, depending on the target group, have experience using Ukrainian platforms for learning. The least active users are people with hearing impairments (18–59 years old), which may be because the products of Ukrainian providers are not adapted to their needs (for example, no sign language translation or subtitles in videos, etc.).

### Experience using Ukrainian platforms for self-education online during the last 12 months

Options	Adult population	Population with hearing impairments	Adolescents
Have experience	23,4%	16,6%	42,3%
Do not have experience	76,6%	83,4%	57,7%

### The following trends regarding the use of Ukrainian platforms for self-education are observed:

- Among all target groups, the share of users of Ukrainian educational platforms is increasing with an increase in the level of digital literacy. For example, among the adult population aged 18–70 with low skills, 12% use educational platforms. At the same time, 78% adults with above basic skills are users of such platforms. On the one hand, it is assumed that the level of skills means having necessary competences to use online platforms. But other factors also matter, such as higher motivation to learn, self-organization, etc.
- Expectedly, the younger population is more likely to choose digital means of self-education compared to older groups (among adults aged 18–70). Whereas among teenagers, the number of users, on the contrary, increases with age. This may be due to the older teenage group (16–17 years old) being more aware of the areas of self-development and having necessary skills for further growth.
- Differences among users with different social status are observed. Notably, the most interested in learning on online platforms are the tertiary students, as well as employed population.

The FGDs with the participants of different target groups helped get in-depth understanding of different approaches to self-education and outline the pool of the most popular platforms that Ukrainians use to develop their knowledge and skills. Although the main focus was on platforms for education of Ukrainian origin, participants mostly do not pay attention is the platform is of Ukrainian or foreign origin, therefore the lists of platforms mentioned by the respondents may contain not only Ukrainian resources. Based on the FGDs, we see that different groups have different approaches to online self-education. In particular, the difference is observed in the platforms chosen for training.



### Adolescents

Prefer using educational content based on a specific request rather than individual courses on a certain topic. This target group mainly uses channels in messengers, YouTube, short educational videos from social networks such as TikTok and Instagram. Applications for studying English are mentioned separately, among which Duolingo is the most popular



### Senior citizens

Do not use specific platforms for the purpose of self-education. When representatives of this target group need information on a certain topic, they use search engine and click on the first displayed results, without being tied to any platforms or social networks



### Entrepreneurs

Most often use the Prometheus platform. Also, they mentioned Diia.Osvita, Duolingo, WikiLegalAid



### Young people

Prefer YouTube to find necessary educational content, the Prometheus platform and Go IT were also mentioned.



### Teachers

The most popular platforms mentioned by the teachers are: Prometheus, Vseosvita, EdEra, and Diia.Osvita



### Doctors

Use the following platforms for self-education: Medvoice, Cochrane, MedEvent, APAM, DocAssist.



### National authorities

Use two platforms: Diia.Osvita and Prometheus



### Employees of local self-government bodies

Use the Prometheus, VUM, EdEra, Room Academy platforms for self-development

However, among these percentages of respondents, a half did not use Ukrainian educational platforms. This finding is important for understanding the potential target audience that can join online educational platforms.

## Reasons for not using Ukrainian platforms for online self-education by target group

Options	👤 Adult population	👤 Population with hearing impairments	👤 Adolescents
Do not know about the availability of such ed-services	42,0%	38,9%	55,9%
Not interested in the topics offered by these platforms	28,3%	9,2%	21,4%
Use other online resources for education	14,2%	7,4%	19,2%
Lack of need or desire to study	4,6%	0,0%	0,0%
Learning online is uncomfortable	4,1%	10,1%	3,5%
Do not use the internet	3,5%	2,1%	0,9%
Lack of digital skills	3,4%	8,9%	0,9%
Lack of technical equipment to study	1,9%	3,9%	0%
My knowledge level is higher than the information provided on educational platforms	1,6%	0,9%	0,4%
Lack of time to study	1,3%	0,0%	0%
Lack of trust in platform developers	1,0%	2,1%	1,3%
Presentation format is not relevant for me	1,0%	2,7%	2,6%
Have doubts about the professionalism of the experts who are involved in the creation of educational content	1,0%	0,9%	0,4%
Other	0,9%	2,1%	0%
Hard to say	4,5%	25,5%	3,9%

Almost a half of respondents noted that the main reason for not using Ukrainian platforms for self-education is not knowing about the existence of these educational platforms. Below are the channels where



the public could come across information about educational platforms. Note that this question referred to online platforms in general (not only Ukrainian platforms). Surely, existing practices and previous experience influence the level of awareness and recognition. For example, among the adults (18–70 years old) who have used educational platforms in the last year, 92% have come across information about educational platforms, while among non-users, this value is 58%. Also, since self-education is more relevant to younger generation (18–49 years old), they report receiving information about such educational platforms more often than the older age group (50–70 years old). Among those who have not come across any information about online educational platforms, the majority are people aged 50+, people with no digital skills or low skills, and residents of rural areas.

### 📌 Sources of information about online self-education platforms over the last 12 months

Options	👤 Adult population	👤 Population with hearing impairments	👦 Adolescents
Social networks (Facebook, Instagram, Twitter, YouTube, etc.)	55,9%	55,9%	66,9%
Social environment (relatives, friends, colleagues, acquaintances)	10,0%	14,9%	16,4%
Channels in messengers	9,9%	10,9%	14,2%
E-mail distribution	8,7%	4,5%	10,7%
TV	7,9%	5,2%	11,2%
Contextual advertising in the search engine / on sites / in applications, etc	5,6%	7,7%	5,7%
Outdoor advertising (billboards, city lights, etc.)	5,4%	3,2%	8,7%
Radio	1,8%	0,7%	2,7%
Print media	1,4%	1,7%	3,0%
Other	0%	1,0%	0,2%
Have not seen information about online self-education platforms	34,3%	33,2%	19,4%

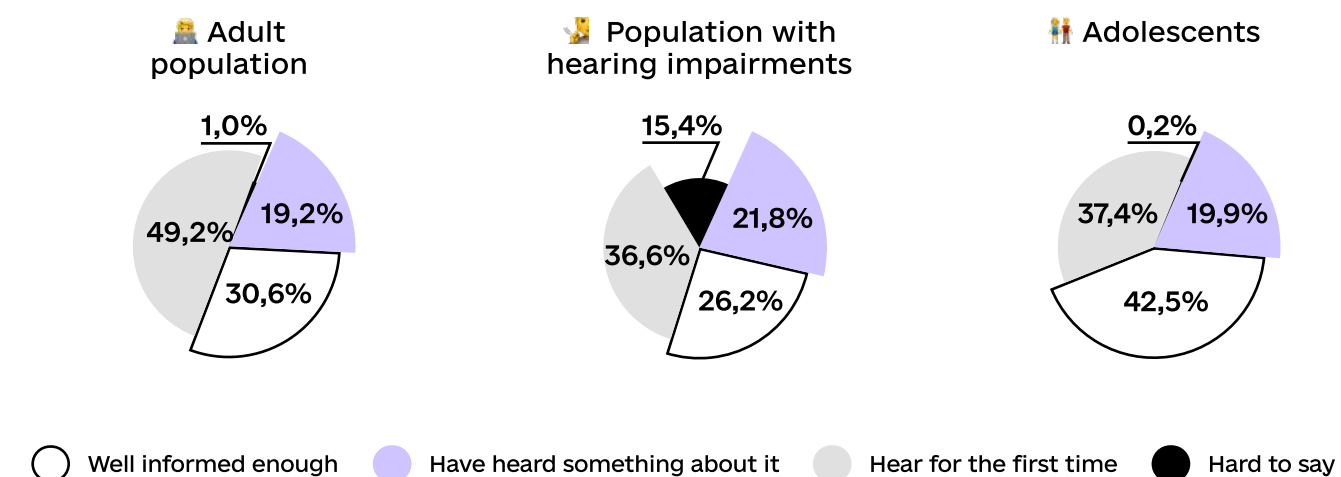
### 💬 Awareness of Diia.Osvita platform and Digital Education Hubs

Awareness about Diia.Osvita educational platform shows an upward trend. Over 2 years, the share of both adults and people with hearing impairments who know about the platform (at least know the name) increased by 34% (in 2021, 16% and 14%, respectively, knew about the platform). When it comes to populations who are familiar with this educational product of the Ministry of Digital Transformation, the following trends are observed:

- 👤 **Awareness about the platform is higher among Ukrainians who use Ukrainian educational platforms** – 80% among users as opposed to 40% among non-users (for adult population aged 18–70);
- 👤 **Social status affects awareness of the educational platform**, with the highest awareness rates observed among the employed population and tertiary students;
- 👤 **Higher level of digital skills of Ukrainians correlates with higher awareness of the Diia.Osvita platform**

Therefore, in terms of improving public awareness of the educational products of the Ministry of Digital Transformation, it is necessary to focus on the elderly and people with no digital skills and low digital skills. The emphasis of the information campaign should be on the benefits and opportunities that a person receives by improving their digital skills.

### Awareness of Diia.Osvita platform





**👤 Awareness of Diia.Osvita platform among the adult population by age groups**

Options	18-29 years old	30-39 years old	40-49 years old	50-59 years old	60-70 years old
Well informed enough	45,2%	30,9%	31,1%	25,3%	20,2%
Have heard something about it	18,9%	21,5%	17,0%	20,4%	17,7%
Hear for the first time	35,6%	46,6%	51,1%	53,0%	60,5%
Hard to say	0,3%	1,0%	0,8%	1,3%	1,6%

**👤 Awareness of Diia.Osvita platform among the adult population by their digital skills level**

Options	No skills	Low skills	Basic skills	Above basic skills
Well informed enough	13,1%	20,1%	26,4%	42,4%
Have heard something about it	21,9%	15,8%	20,7%	20,9%
Hear for the first time	62,1%	62,5%	52,2%	36,4%
Hard to say	2,9%	1,6%	0,7%	0,3%

During the FGDs, the participants talked about their awareness of the Diia.Osvita platform and their experience using educational materials.

The most famous products are:



**Digitogram**



**Educational series**

Representatives of various target groups who have experience using Diia.Osvita products named the following advantages of this platform:



**Possibility to return to the studied material**



**Availability of tests to check the learning progress**



**Selection of educational material by level**



**Availability of certificates**



**Quick feedback from the support service**

«In general, I liked the platform. Because you can return to the material if you did not understand something – you can listen again and read. Also, the tests. Overall, I like the platform. It is relevant, quite relevant for beginners. Those who used know that it starts with easier questions. Than if offers the middle level for users of digital education. That is, you can choose a course according to your level».

FGD, professional group of teachers, f

«The only thing is, I called the support service – because when I passed the first test for the first educational series, the certificate I received was without my last name. Just an empty certificate, that's what I received. So I called the support service the next day – they said that this happens, and now everything will be done. Literally 10 minutes they called me back. Very quickly. And they said: «You are all set, you can download your certificate».

FGD, professional group of teachers, f

Among the FGD participants, **some informants know about the Diia.Osvita platform**, however, they have never used the presented educational products. The main reasons for this are:

1

lack of clear understanding of the subject matter of the courses / educational products presented on the platform

2

having no need for it

3

an idea prevalent among the public that Diia.Osvita is an educational platform that only offers materials related to digital literacy

Increased awareness of Digital Education Hubs is also observed.. Among the adult population, the awareness of the Hubs in their place of residence increased by 7% (in 2021 it was 9%), among people with hearing impairments, positive changes amounted to 4% (in 2021, 20% respondents were aware of such Hubs).

### Awareness of Digital Education Hubs

Options	👤 Adult population	👤 Population with hearing impairments
Yes	15,5%	23,8%
No	27,3%	17,8%
Do not know	57,2%	58,4%

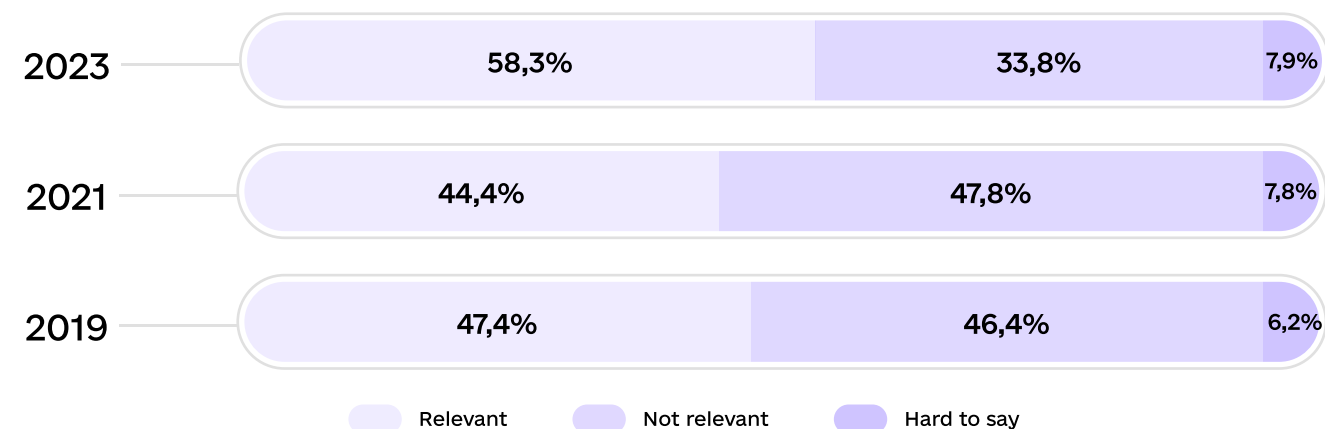
### 📖 Relevance of digital skills development

This subsection focuses on the relevance/need of developing digital skills – not just from the perspective of having basic awareness, but also in terms of expanding and deepening the knowledge. The data show that interest in learning digital skills is common for all target groups, but to a different degree. Namely, the adult population (18–70 years) and teenagers (10–17 years) show increased need for digital skills development (increase by 14% for each target group compared to 2021), while people with hearing impairments, on the contrary, express less interest in developing digital skills (7% less than in 2021). But it is important to note that this decrease occurs at the expense of the increased percentage of “uncertain” respondents.

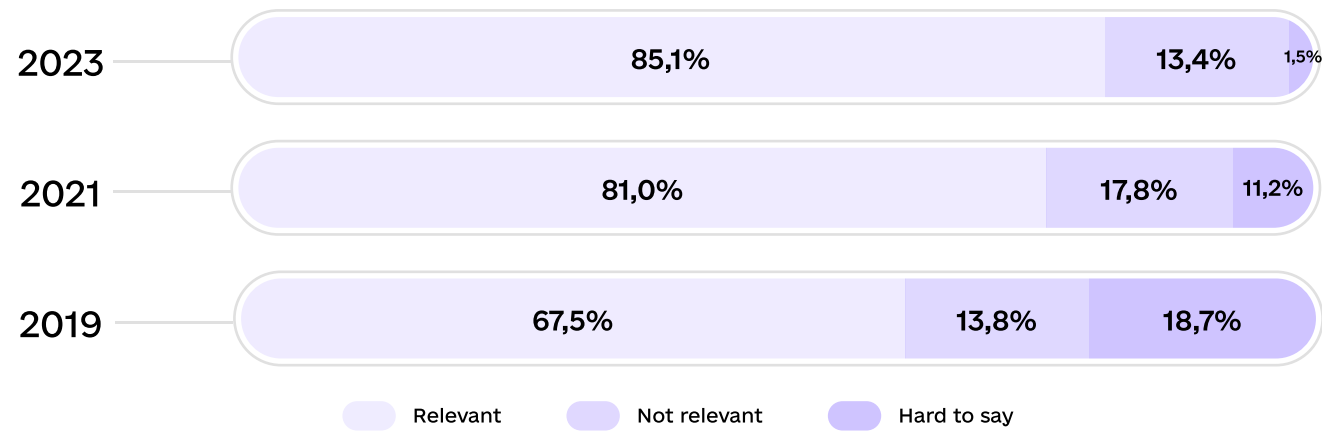
### Relevance of digital skills development

Options	👤 Adult population	👤 Population with hearing impairments	👤 Adolescents
Relevant	58,3%	45,8%	85,1%
Not relevant	33,8%	14,3%	13,4%
Hard to say	7,9%	39,9%	1,5%

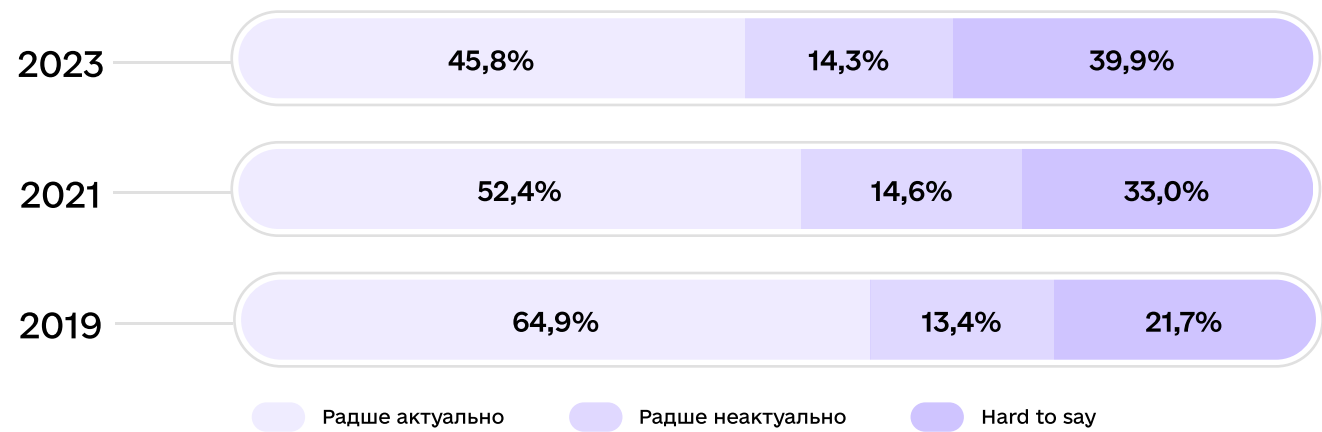
### 👤 Dynamics of relevance of digital skills development among the adult population



### 👥 Dynamics of relevance of digital skills development among adolescents



### 👤 Dynamics of relevance of digital skills development among people with auditory disabilities



The need for the development of digital skills is not reported uniformly by different population groups. Among teenagers (10–17 years old), the desire to improve digital skills has almost no differences within smaller age groups. However, among the adult population (18–70 years old) and people with hearing impairments (18–59 years old), the younger groups have more interest in digital skills development compared to older groups. Another important result is that the relevance of development of digital skills is closely correlated to the existing level of digital literacy. People with higher digital literacy report higher needs for training/development of digital skills. The conclusion is: **Ukrainians are interested in professional knowledge and strengthened digital competences rather than in learning some basics for working in a digital space.**

### 👤 Dynamics of relevance of digital skills development among the adult population by age groups

Options	18-29 years old	30-39 years old	40-49 years old	50-59 years old	60-70 years old
Relevant	73,9%	64,5%	62,0%	50,8%	37,6%
Not relevant	21,8%	28,4%	29,0%	40,1%	52,0%
Hard to say	4,3%	7,1%	9,0%	9,1%	10,4%

### 👤 Dynamics of relevance of digital skills development among the adult population by their digital skills level

Options	No skills	Low skills	Basic skills	Above basic skills
Relevant	22,1%	41,2%	57,1%	76,6%
Not relevant	66,1%	46,6%	36,8%	18,7%
Hard to say	11,8%	12,2%	6,1%	4,7%




The reported reasons for not having the need in the development of digital skills include both objective factors and internal motivation. For example, almost one in three respondents with no skills report the barrier such as lack of technical means for learning and using in the future. On the other hand, this group also shows internal inertia regarding the training and use of digital technologies. Аргументація причин неактуальності розвитку цифрових навичок лежить у площині як об'єктивних факторів, так і внутрішньої мотивації.

39% respondents of this group indicate that they do not need to develop digital skills, because they know enough for everyday activities. As the majority of the non-digitally literate population represents the older age group (60-70 years), it is assumed that their level of motivation to acquire knowledge and understand the benefits of digital skills is lower than among the younger population.

For population aged 50+, the question of how and what to study is more relevant, but it is more difficult for them to find the necessary information, navigate in available products, and systematize knowledge. At the same time, the younger generation report no problems with it, they express more confidence in a sufficient level of digital knowledge to solve a specific request.




## Reasons for not having the need in the development of digital skills

\*Multiple response questions

Options	 Adult population	 Population with hearing impairments	 Adolescents
Do not need to develop digital skills, because know enough for everyday activities	48,6%	36,2%	42,6%
Do not need to study. If a specific question arises, find the answer	26,6%	25,9%	31,5%
Lack of time	22,3%	20,7%	13,0%
Do not understand how and why to study	12,0%	39,9%	7,4%
Lack of technical means for learning	11,5%	13,0%	13,0%
Other	1,8%	0%	0%
Hard to say	0,1%	0%	11,1%

The respondents who feel the importance of developing their digital skills were asked a question about a convenient form of training. Among all target groups, the most popular form was the combination of online and offline education, and about a third of respondents supported the idea of exclusively online education. The older age group (60-70 years old) refers to the learning format when the younger generation teaches the elderly. For them, it is associated with greater convenience, accessibility, and trust compared to, for example, learning in an online hub with a tutor.

## Various forms of learning digital skills

Options	 Adult population	 Population with hearing impairments	 Adolescents
Online training using the appropriate platform	35,5%	29,2%	28,1%
Children (grandchildren) teach their parents (grandparents)	6,4%	14,1%	0%
Training in an offline hub (with the possibility of consulting a coach)	17,8%	14,5%	30,1%
Combination of online and offline training	40,3%	42,2%	41,8%

## Assessment of teenager satisfaction with computer science school course

Previous subsections focused on informal learning and self-development, in particular in the field of acquiring digital competences. However, for teenagers (10–17 years old), it is mandatory to develop digital skills within the framework of computer science courses at school. 94% of the interviewed teenagers study computer science as part of formal education. 79% of the interviewed teenagers are satisfied with the computer science course they have at their school. The share of those who consider the course unsatisfactory increases with the age of the interviewees. This trend is explained by the fact that for the age group of 16–17 years, the opinion that the school curriculum is outdated and does not meet the needs of the modern world is more common. Probably, this is because this is the oldest age group of teenagers, and they have stronger critical thinking and deeper understanding of real needs for the development of digital skills that are not covered by the curriculum.

## Satisfaction with computer science school course among adolescents

Strongly satisfied	42,5%
Satisfied	36,9%
Dissatisfied	11,9%
Highly dissatisfied	5,0%
Hard to say	3,7%

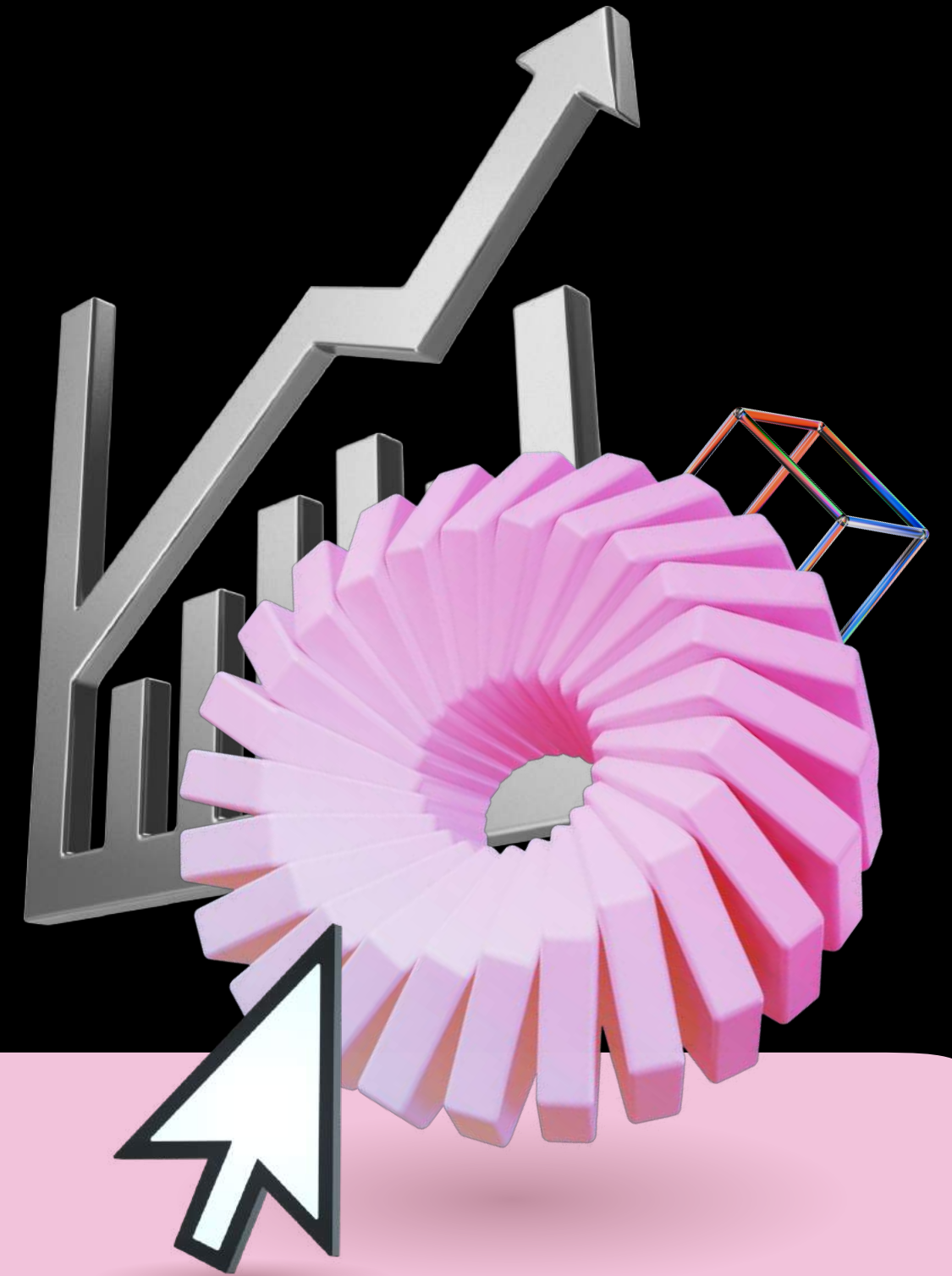
Differences in the level of satisfaction with the computer science course among schoolchildren in different macro-regions of Ukraine should be also noted. The highest level of satisfaction is observed among residents of the western regions (84% teenagers are fully satisfied or mostly satisfied), while in the eastern regions, the satisfaction level is 71%. It may be caused by the peculiarities of the educational process. As mentioned above, 74% of school students have a distance or mixed format of education (in particular, schools in the regions closer to the frontline have to resort to remote forms of instruction more often). It may affect the assessment of the quality of education in general, and of certain courses in particular.



# 4

Section

**Role of digital skills in  
achieving success**

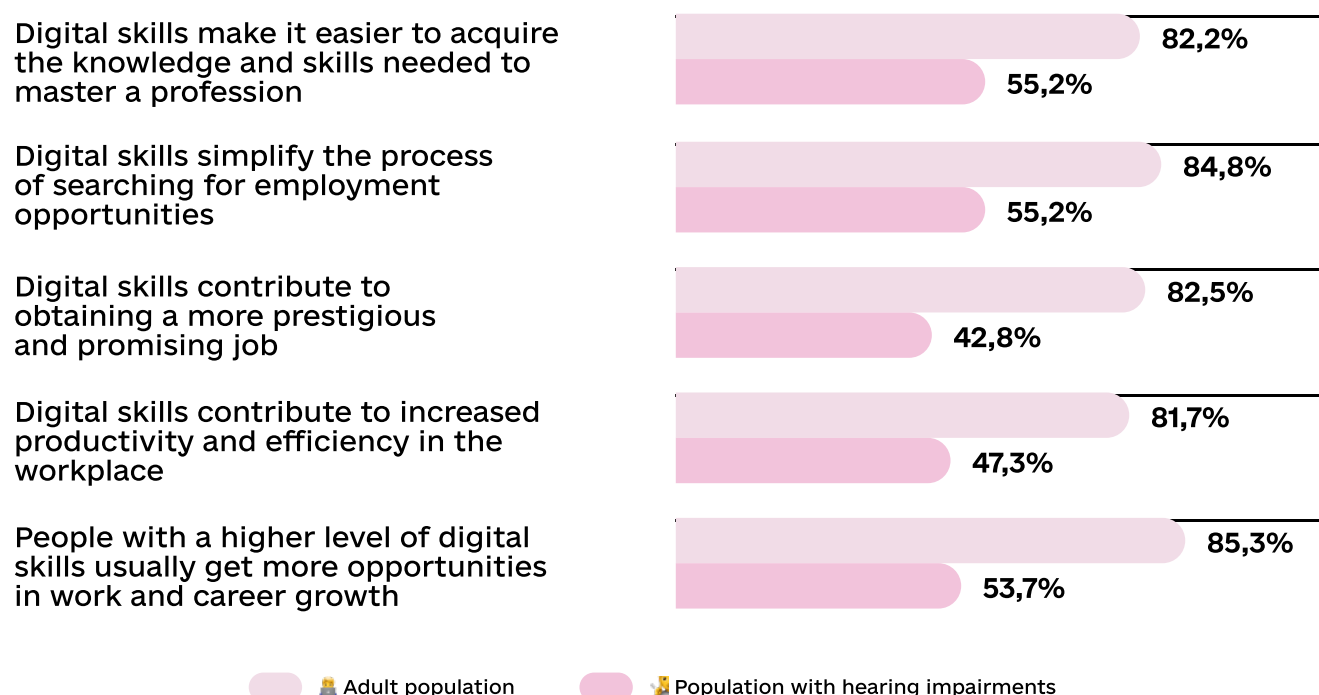


# Role of digital skills in professional life

65% adults and only 27% people with hearing impairments agree with all of the proposed statements about the role of digital skills in professional life. Such a gap is explained by unequal employment opportunities of these two groups. People with hearing impairments in Ukraine face significant barriers in getting an education and a job, but they compete on the labor market with other candidates on general terms – that is, they are subject to the same requirements regarding the level of education, professional experience and other competencies. Creating equal rights and opportunities for self-fulfillment and employment of citizens covers many factors, and digital skills are one of the tools to overcome inequality. It is obvious that the government and society should create better conditions for barrier-free access, not limited to the area of digitalization.

## 🌟 General benefits of digital skills in professional development

\*The share of those who answered «Agree»



Among adults, perceptions of the value of digital skills for careers are correlated with age and current level of digital skills, which is related to each other. The younger the respondent, the more likely they are to agree with the benefits of digital skills for the professional life. As the level of digital literacy increases, the awareness of the role of digital competences in the career context increases, too. In addition, people with no digital skills or with low skills (for example, unemployed or retired) more often than others cannot determine their attitude to the proposed statements, which demonstrates their superficial understanding of how digital skills can be used and how they make life/work easier.

## 📊 Influence of digital skills on the economy

**81% of Ukrainians believe that improved digital skills of the population can positively affect the economy of Ukraine in general.** Among people with hearing impairments, the share of those who agree and those uncertain is almost the same – 48% and 43%, respectively. As already mentioned, this perception of digitalization processes by people with hearing impairments is determined by the general context – these people do not feel equal in society.

👤 Increasing the digital skills level among the population can have a positive effect on the economy of Ukraine in general among the adult population by their digital skills level

Options	No skills	Low skills	Basic skills	Above basic skills
Agree	59,7%	73,2%	82,3%	89,8%
Disagree	22,9%	9,9%	6,9%	3,8%
Hard to say	17,4%	16,9%	10,8%	6,4%

 Life satisfaction in different areas

51% Ukrainians feel satisfied with what they do every day. Among people with hearing impairment, this percentage is twice as low – 24%. In general, the perception of life satisfaction decreases with increasing age of respondents in both target groups.

The adult population and people with hearing impairments also differ in satisfaction with their environment, readiness to take responsibility and engage in self-development. However, this does not affect the assessment of financial growth over the last year, where there is no statistically significant difference between these target groups.

It is quite reasonable that the younger the respondent, the more satisfied they are with their life. Another important factor is employment status, with employed people scoring higher on all life satisfaction parameters than non-employed and retired people, and tertiary students showing the highest scores compared to all other groups. As already mentioned, there is a strong relationship between age and type of employment, so such correlation is predictable.

Below, the results are stratified by groups of the employed population. Among the adult population aged 18–70, the sample is 1,345 respondents, and among people with hearing impairments aged 18–59, there are 241 employed respondents.

59% Ukrainians feel that they are achieving their goals in life. Among people with hearing impairment, this percentage is 29%.

More than one in three Ukrainians (36%) do not have policies on cyber security and/or cyber hygiene at the workplace, and one in four (26%) says there are no effective measures to protect confidential information. Gaps in digital security and data protection at work are more likely to be reported by older people and people with low skills. On the one hand, this may be related to structural economic factors (for example, companies that have developed digital security policies hire younger professionals with a higher level of digital literacy). On the other hand, it may indicate the superficial application of such policies by older people with minimal digital skills. At the company level, this group of employees needs additional attention and training.

 Life satisfaction in different areas

91% teenagers believe that digital skills are necessary for them to study, and 84% consider them important for their future careers. In addition, while the awareness of the role of digital skills in education increases with the age of the respondent, the perception of the value of digital competences in the career is almost the same in all age groups.

At the same time, there is a correlation between the assessment of the importance of digital skills for study or work and current level of digital skills in respondents. The better digital skills a teenager has, the more important for them is their role in the educational process and future career. Therefore, wider or more intensive practices of using digital technologies contribute to the awareness of their value and importance for the future. In other words, having experienced the benefits of digital skills in practice, teenagers will be willing to use them in the future.

 The level of agreement with the statements among adolescents by their digital skills level

\*The share of those who answered «Agree»

Statements	No skills	Low skills	Basic skills	Above basic skills
Digital skills are essential for my studies	73,7%	83,9%	88,3%	94,2%
Digital skills are essential for my future career	57,9%	64,5%	79,2%	89,5%

84% teenagers believe that using the Internet gives more advantages than disadvantages, and for 4 out of 5 teenagers (80%), it helps save time. In addition, awareness of the value of the Internet increases with the age of the respondents.

Among children aged 10–12 years, the percentage of those who agree that the Internet is rather beneficial is 76%. Among the respondents in the 13–15-year-old group, it is 85%, and among 16–17-year-olds, 94%. This may be due to the fact that as children grow up, they better understand the potential of digital technologies and learn to use them.



**96% of teenagers use the Internet to communicate with family and friends, and 58% do not feel lonely thanks to the Internet.**

Using the Internet to keep in touch with relatives or friends is more popular among older children than among younger ones. Notably, among 10-12 years old, 89% use the network for this purpose, among teenagers aged 13-15, this value is 95%, and among teenagers aged 16-17, 98%.

Among girls, 63% overcome loneliness thanks to the Internet, while among boys this value is 54%. In addition to sex, the type of settlement affects whether the Internet helps overcome loneliness. Among residents of regional centers, the share of those who agree with the statement “Thanks to the Internet, I don’t feel lonely” is the highest at 66%, while among residents of smaller cities and villages, this value is 49% and 55%, respectively. This may be due to various factors – from upbringing practices to differences in how close the teenagers stay in different types of settlements.

93% adolescents aged 10-17 easily learn to use new applications and software. This factor correlates with the level of digital skills. Namely, among adolescents with low skills, the share of those who agree with this statement is 74%, and among adolescents with basic and above basic skills, the values are 94% and 95%, respectively. This is reasonable, because the higher the level of digital skills, the easier it is to master new software. In addition, compared to 2021, the share of those who find it easy has increased by 8%, which confirms improved skills related to the use of digital technologies.

**👤 The level of agreement with the statements among adolescents by gender**

\*The share of those who «Agree»

Statements	Female	Male
Using the internet helps me keep in touch with family and friends	97,9%	94,8%
I have the ability to quickly grasp and use new applications or programs	95,3%	91,2%
The benefits of using the Internet outweigh the drawbacks	84,8%	82,9%
The internet plays a role in saving time	80,1%	80,3%
The internet plays a role in alleviating feelings of loneliness for you	62,8%	53,9%
I use the internet for entertainment, but I do not use it for education	14,7%	23,3%

**84% respondents aged 10-17 consider that they spend a lot of time on the Internet, and almost one in three teenagers (29%) feels anxious when not being able to use the network.**

Comparing the findings from 2021 and 2023<sup>3</sup>, the share of those who agree with the statement “I spend a lot of time on the Internet” has increased by 15%, and concern about the inability to connect to the Internet has decreased by 17%. A gender difference is observed – girls are more likely than boys to worry that they use the Internet too much, and are more likely to feel anxiety without access to the network.

**One on 16 teenager (6%) feels anxious because of four reasons at the same time:**

- 👉 the amount of time spent on the Internet,
- 👉 their own digital skills, believing they are not good enough,
- 👉 lack of knowledge about the protection of personal data when using the Internet,
- 👉 feeling of anxiety when there is no access to the Internet.

<sup>3</sup> - In 2019, these questions were not asked.



**About one in three teenagers (31%) do not know how to protect their data when using the Internet. In addition, the younger the age of the respondent, the higher is the share of those concerned with data security. This means that learning cyber hygiene is relevant for children aged 10–17 and should be integrated into the formal education already in the primary school.**

According to the 2023 study findings, 35% respondents aged 10–17 are concerned that their digital skills are not good enough. Two years ago, in 2021, this value was 39%, that is, the difference is not statistically significant.

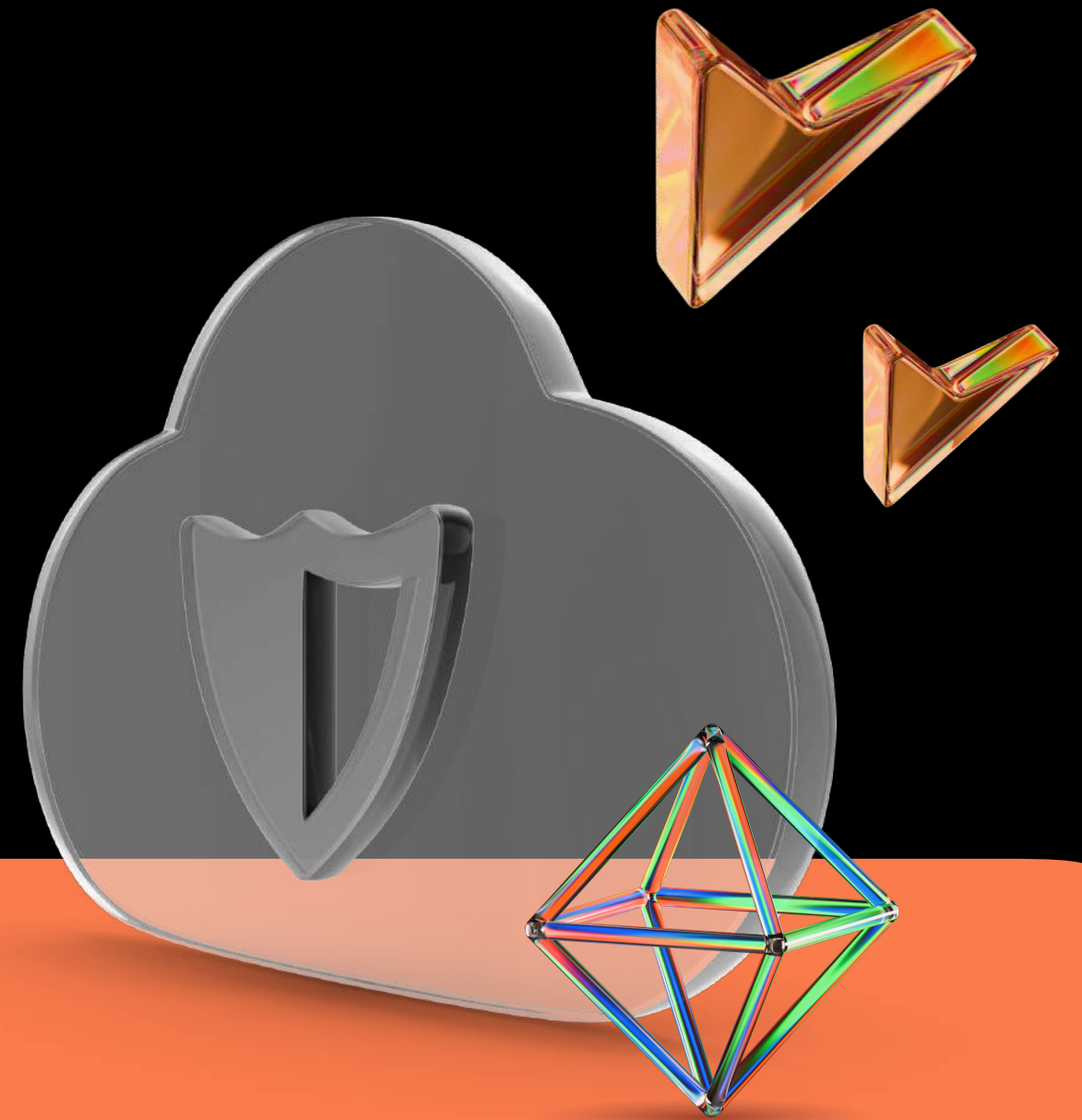
**Among children with the above basic digital skills, 31% worry if their skills are good enough. Among children with lower levels of skills (low or basic skills), the share of those concerned about the quality of their skills is at least 10% higher and amounts to 42% and 46%, respectively.**

Teenagers who live in rural areas are more likely than their urban peers to worry if their digital skills are good enough – 41% in rural areas compared to 33% in smaller cities and 32% in regional centers. In addition, they are less aware of how to protect their data when using the Internet. The percentage of those who agree with this statement among rural teenagers is 39%, while among teenagers in smaller cities and in regional centers – 23% and 29%, respectively. This means that adolescents living in rural areas need additional attention – notably, they should be better covered with activities aimed at building their digital skills, in particular, in the field of cyber hygiene.

Section

# 5

## Security on the internet



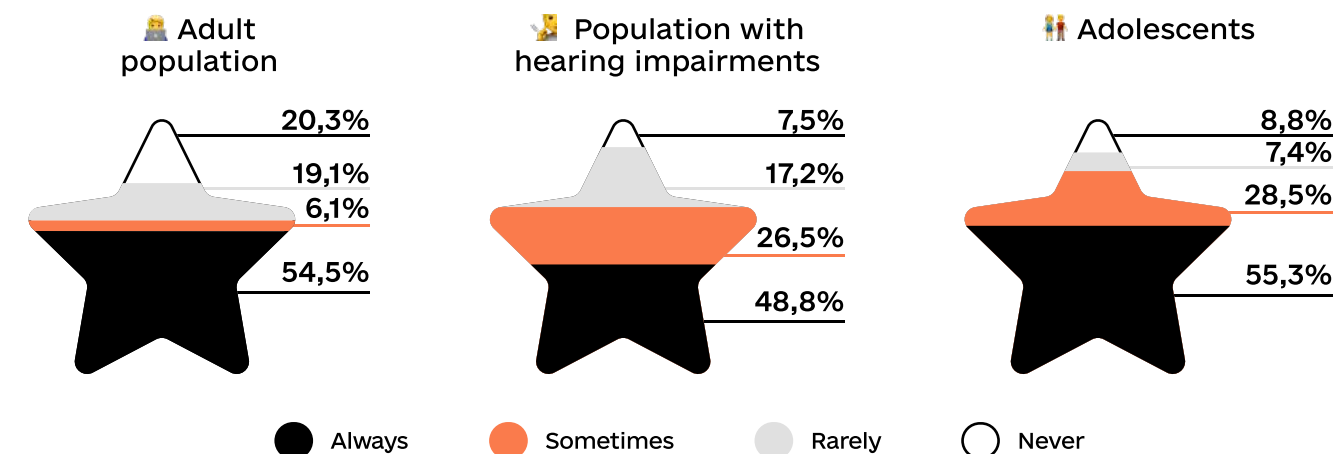
This section highlights the practices of using cyber security and data protection measures, the experience of encountering cybercrimes, and the potential for increasing the level of personal data protection among Ukrainians. It is based on the analysis of three target groups: adults (18–70 years old), people with hearing impairments (18–59 years old) and teenagers (10–17 years old) who use the Internet in everyday life.

## Application of cyber security measures

In a world where the use of the Internet is becoming an integral part of everyday life, the protection of personal data is the responsibility of every user. Taking into account globally increased prevalence of privacy violations and cyber attacks, as well as hostilities in Ukraine, cyber security and cyber hygiene take on special importance.

According to the study findings, 80% adults (18–70 years old), 91% teenagers (10–17 years old) and 92% people with hearing impairments (18–59 years old) use certain means of personal data protection. However, when it comes to the sustainability of cyber security practices, these means are used ad hoc rather than systematically by as many as approximately 25% of the adult population and almost a half of people with hearing impairments.

### Application of cyber security measures



Personal information protection practices are related to the work environment. Notably, those who agreed with the statements “The workplace uses effective measures to protect sensitive information” and “I have clear instructions and training on cybersecurity and/or cyber hygiene in the workplace” are 25% more likely to have ongoing data protection practices on the Internet (up to 72%).

A rather expected finding is a different degree of prevalence of behaviours aimed at protecting personal information among Ukrainians with different levels of digital literacy. Namely, among the respondents with no skills, as many as 72% do not use any data security measures, and among the respondents with above basic skills, this percentage is only 5%. Given that the question is based on an individual’s meaningful experience with the use of data security measures, it cannot be ruled out that some part of the population may take certain measures in the field of cyber security without realizing it.

### Prevalence of behaviours aimed at protecting personal information among the adult population by their digital skills level

Digital Skills Level	Always	Sometimes	Rarely	Never
No skills	19,0%	9,5%	0,0%	71,5%
Low skills	35,0%	16,1%	8,0%	40,9%
Basic skills	55,9%	22,5%	8,3%	13,3%
Above basic skills	71,6%	20,1%	3,4%	4,9%

Below is a list of security measures most often used by Ukrainians to protect personal information and data. Notably, the top 10 protection measures are the same among all target groups. They only differ by the sequence in the list – that is, by how often different measures were used by certain population groups. The diversity of measures used by people with different levels of digital skills is a confirmation of the differences in cyber protection practices. For example, the respondents with no skills who at least occasionally use data protection measures mostly report using only one measure, while the respondents with above basic skills on average use five different measures to ensure information security. The average number for the general sample is four measures.

### Top 10 protection measures among all target groups

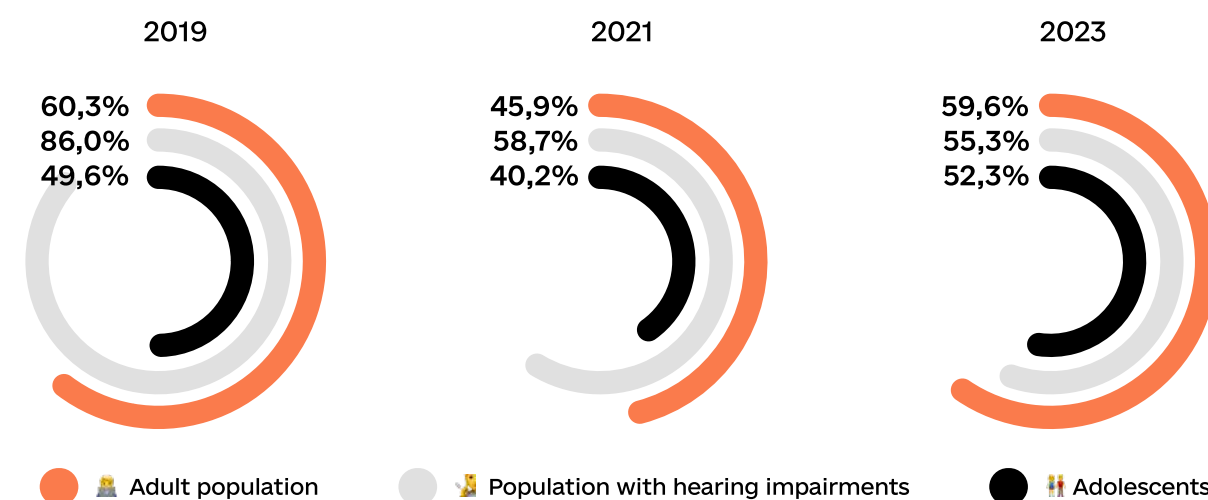
\*Multiple response questions

Types of cyber security measures	👤 Adult population	👤 Population with hearing impairments	👤 Adolescents
Using complex passwords	71,3%	50,0%	64,1%
Регулярна зміна паролів	36,0%	16,5%	35,0%
Using an installed antivirus software / firewall	29,9%	21,4%	29,9%
Use unique passwords for each account	29,8%	29,5%	39,0%
Restriction of access to personal information in social networks	27,8%	24,1%	25,6%
Using two-factor authentication	23,9%	18,9%	28,2%
Creating backup copies	22,2%	14,3%	20,2%
Carefully check emails and links for fraud	21,5%	19,7%	21,1%
Installation of applications on the phone only from the official application market	21,1%	18,4%	21,4%
Installing applications on a computer/ laptop only from official sources	17,4%	17,6%	20,2%

### Experience of facing Internet security issues

The study of personal experience of Ukrainians in the context of encountering security violations on the Internet demonstrates that different target groups have encountered illegal activities on the Internet to varying degrees. Among the adult population (18–70 years), the percentage of those who have faced problems related to security in the global network has increased by 14% in the last 2 year. Among teenagers, the increase is 12%. Among people with hearing impairments, the prevalence of data security problems remained at the same level (the difference is within the margin of error).

#### Dynamics of the presence of security problems due to the use of the internet in the last 12 months



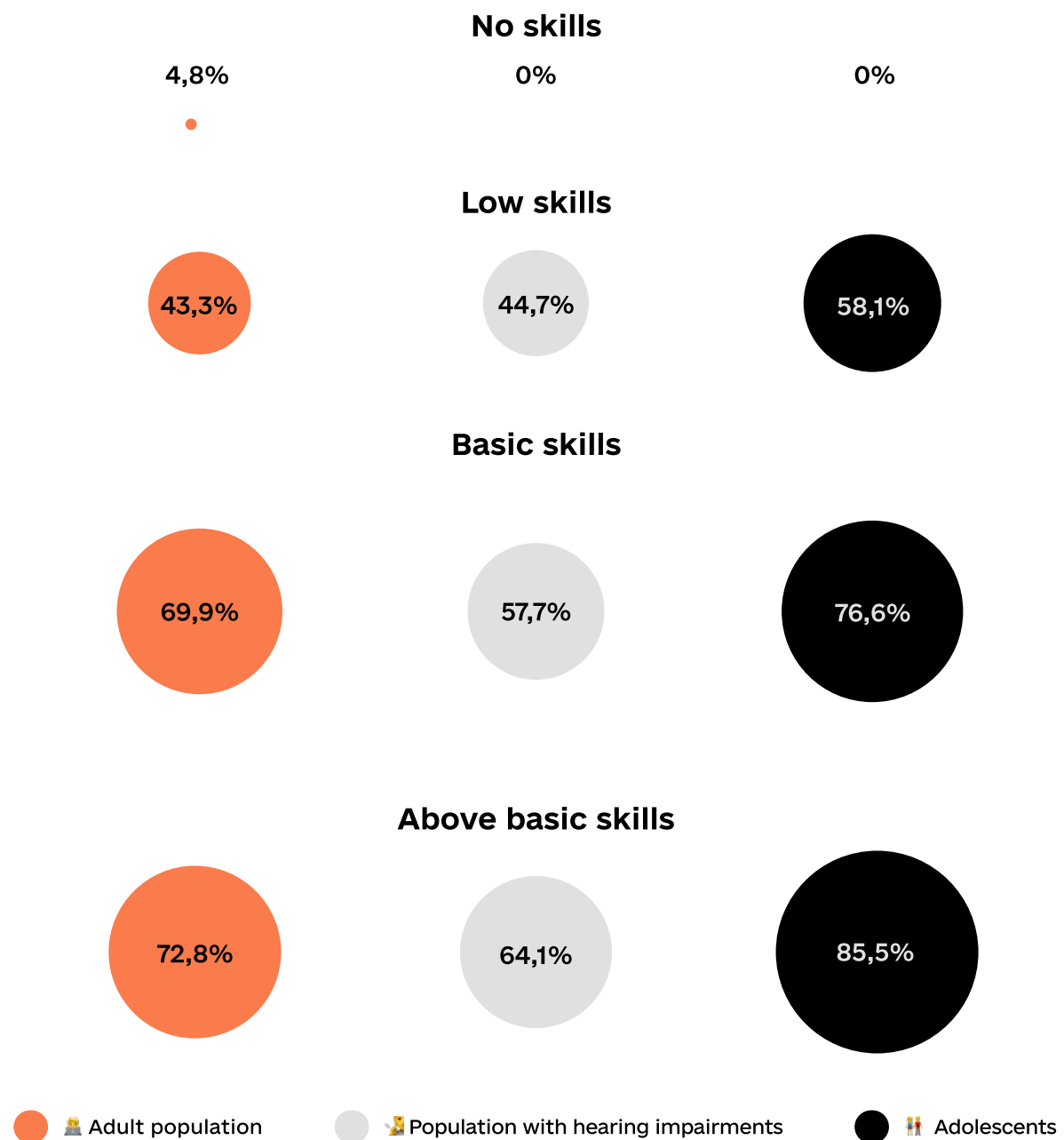
#### Experience of facing Internet security issues by macro region

Macroregions	👤 Adult population	👤 Population with hearing impairments	👤 Adolescents
West	62,5%	53,2%	78,5%
South	55,1%	57,1%	81,6%
North	62,6%	55,3%	84,9%
East	61,0%	60,5%	88,9%
Center	49,0%	50,0%	70,2%



The number of incidents of Internet security breaches increases with increased levels of digital literacy. It is explained by better knowledge and skills developed to recognize fraudulent activities, because people with lower digital awareness may not realize that their security data was breached. The same is true for the differences between the age groups: young people (18–29 years old) more often note incidents of illegal activity on the Internet than representatives of the oldest age groups (60–70 years old) – 67 and 49%, respectively. This is explained by the fact that with increasing age, the frequency and duration of Internet use decreases, and the level of digital skills also gets lower.

### Experience of Internet security issues among the target audience in the last 12 months by digital skills level



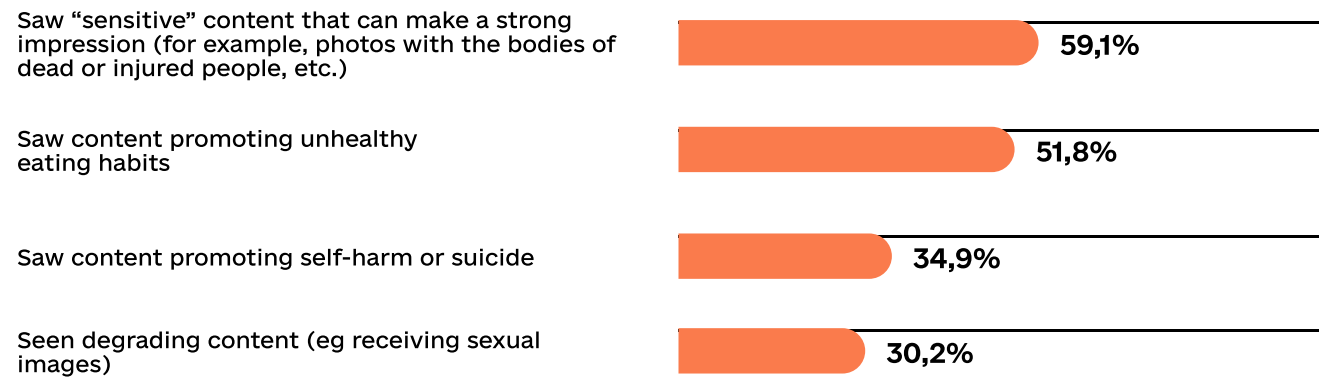
### Internet security issues in the last 12 months

\*Multiple response questions

Options	Adult population	Population with hearing impairments	Adolescents
Receiving fraudulent messages ("phishing")	43,5%	30,5%	35,2%
Receiving messages from friends/acquaintances asking to transfer/borrow funds through their hacked account	19,7%	18,0%	14,3%
Redirection to fake websites with a request for personal information ("farming")	18,2%	16,0%	19,8%
Getting viruses	17,5%	20,5%	22,1%
Suffered financial losses due to theft, receiving fraudulent messages or being redirected to fake websites	11,1%	13,5%	10,9%
Social network or email has been hacked	6,6%	10,8%	14,8%
Children's access to unwanted sites	6,0%	16,3%	21,6%
Data loss due to a virus	5,9%	10,5%	12,0%
Loss of a device (smartphone, laptop, etc.) with subsequent use of data on it by third parties	5,5%	11,8%	15,4%
Internet identity theft	3,5%	8,8%	6,5%
Misuse of your personal information available online has resulted in discrimination, harassment, bullying, threats, harassment, etc.	3,0%	7,8%	7,6%

### 👤 Internet security issues among adolescents in the last 12 months

\*Multiple response questions



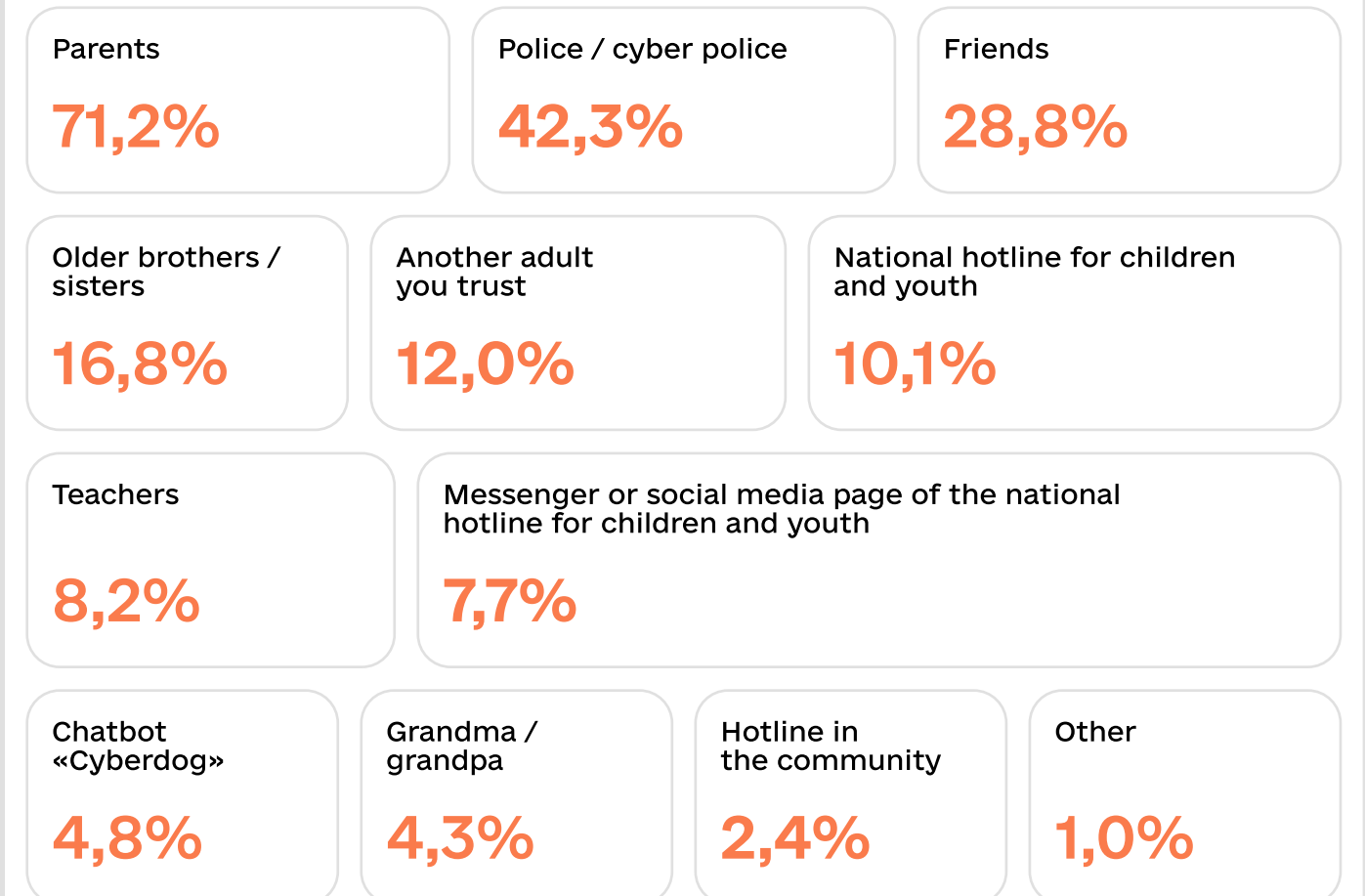
These trends justify the statement that the real level of prevalence of data security problems on the Internet may be higher than detected. The main reason is the ignorance of a part of the population regarding possible illegal activities regarding their personal data on the Internet.

In 2023, four new statements were added for the teenagers to assess Internet safety (10–17 years old). Taking them into account, 81% teenagers experienced problems with illegal activities on the Internet. The data in the graphs will be demonstrated with these statements in mind.

The average frequency of security problems also varies among target groups. For example, the adult population (18–70 years old) mentioned two incidents related to safety on average, people with hearing impairments (18–59 years old), three instances on average, and teenagers, four instances on average. Therefore, the issue of cyber security among minors should remain a priority for digital policy-makers. This is especially so because, as outlined in Section 4. Life satisfaction in various areas, about one in three teenagers indicated that they do not know how to protect their data on the Internet.

### 👤 Representatives to whom children would turn in case of illegal actions on the Internet

\*Multiple response questions



### 👤 Experience of the use of "parental control" among parents of teenagers by age groups

Options	10-12 years old	13-15 years old	16-17 years old	Усі підлітки
They use	23,6%	7,0%	2,1%	12,2%
They did use early	14,2%	13,4%	8,5%	12,5%
They have never used	58,8%	78,9%	88,3%	73,5%
Do not know	3,4%	0,7%	1,1%	1,8%

As the responses to previous questions showcase, 8 in 10 teenagers face one or another problem related to Internet security. Therefore, it is important to choose strategies for the minors to respond to illegal activities on the Internet. We see certain features of behaviour that are used or planned to be used when such situations arise in the digital environment. For example, adolescents aged 10–12 years are primarily focused on seeking help from close adults, while the older age group of 13–17-year-olds are more inclined to address the situation on their own using available tools such as spam notification, blocking or interacting with a person who committed illegal activities. Also, this age group is more likely to approach the specialized organizations: for example, among 16–17-year-olds, 59% are ready to approach the police/cyber police, while 8% less would approach their parents. This data confirms the desire of teenagers, especially the older age group, to independently address these problems. In addition, they indicate a decline in parental authority. The latter can potentially create additional risks for teenagers falling into a situation of breach of security on the Internet. In addition, the level of control on the part of parents also decreases. For example, among teenagers aged 10–12, 38% had previously or currently used the parental control software, and among the group aged 16–17, only 11%.

Almost one in two teenagers aged 10–12 has had the experience of meeting new people online, and since the age of 13, more than 68% of those interviewed report such practices. Mostly, teenagers say that such experience was positive or neutral. Up to 3% of survey participants have predominantly negative experiences. In addition, no differences were found among different age groups. Since this study is not aimed at an in-depth analysis of the causes of negative experience, it cannot be argued that these negative acquaintances were related to illegal activities against these teenagers.

### Using data protection services

Returning to the issue of general security on the Internet, next question to discuss is the experience of using specialized software for improving data protection, and the potential willingness to spend money on paid cyber security services.

Today, **42% adult population (18–70 years old) use data security services, of which 5% already use paid software.** Among people with hearing impairments, the share of users of data security services is 43%, of which 6% use paid software. In the future, the practice of using software for data protection will continue to grow with the increased level of digital literacy. Among the respondents with no skills, only 14% adult population use specialized services, and among the respondents with above basic skills, this value is 54%. Respondents with no skills and low skills almost do not use paid software or applications.

**Potential readiness to pay for data protection services was reported by about 30% Internet users among the adult population (18–70 years) and 27% among people with hearing impairments (18–59 years).** Previous experience of encountering illegal activities on the Internet also affects the willingness to use paid software. Notably, among those who have not encountered data security problems, 23% see the need to use paid software, and among those who have come across such issues, 36% report potential willingness to use paid services (among adults aged 18–70).

Financial status is also a factor affecting the willingness to pay for services to improve data protection. Among the adult population (18–70 years) with a below average income, approximately one in four are considering the possibility of using paid software or already use them, and among the population with an above average income, this share is 53%.

### Data security when using instant messaging services

The last question in this section on the Internet security has become more acute because of the full-scale war in Ukraine. In addition to the potential for hacker attacks and theft of personal data of Ukrainians, there are cases of untargeted data leakage that can be used by the enemy against Ukraine (for example, reports on the location of military facilities or the consequences of an aggressor's attacks, video or photo content in personal correspondence). According to the study findings, **one in two adult Ukrainians (18–70 years old) chose not to share information that could harm the national security.** Among people with

**hearing impairments, one in three reported choosing not to share such information** (however, among this category, the share of those who possessed such information was smaller). Accordingly, from 21% among the adult population (18–70 years) to 28% among people with hearing impairments (18–59 years) could use instant messaging services to share information of interest to the aggressor country. However, it is important to emphasize that it is about personal communication where a person can carelessly share information that can harm the state and the armed forces, rather than the purposeful transmission of information to the enemy.

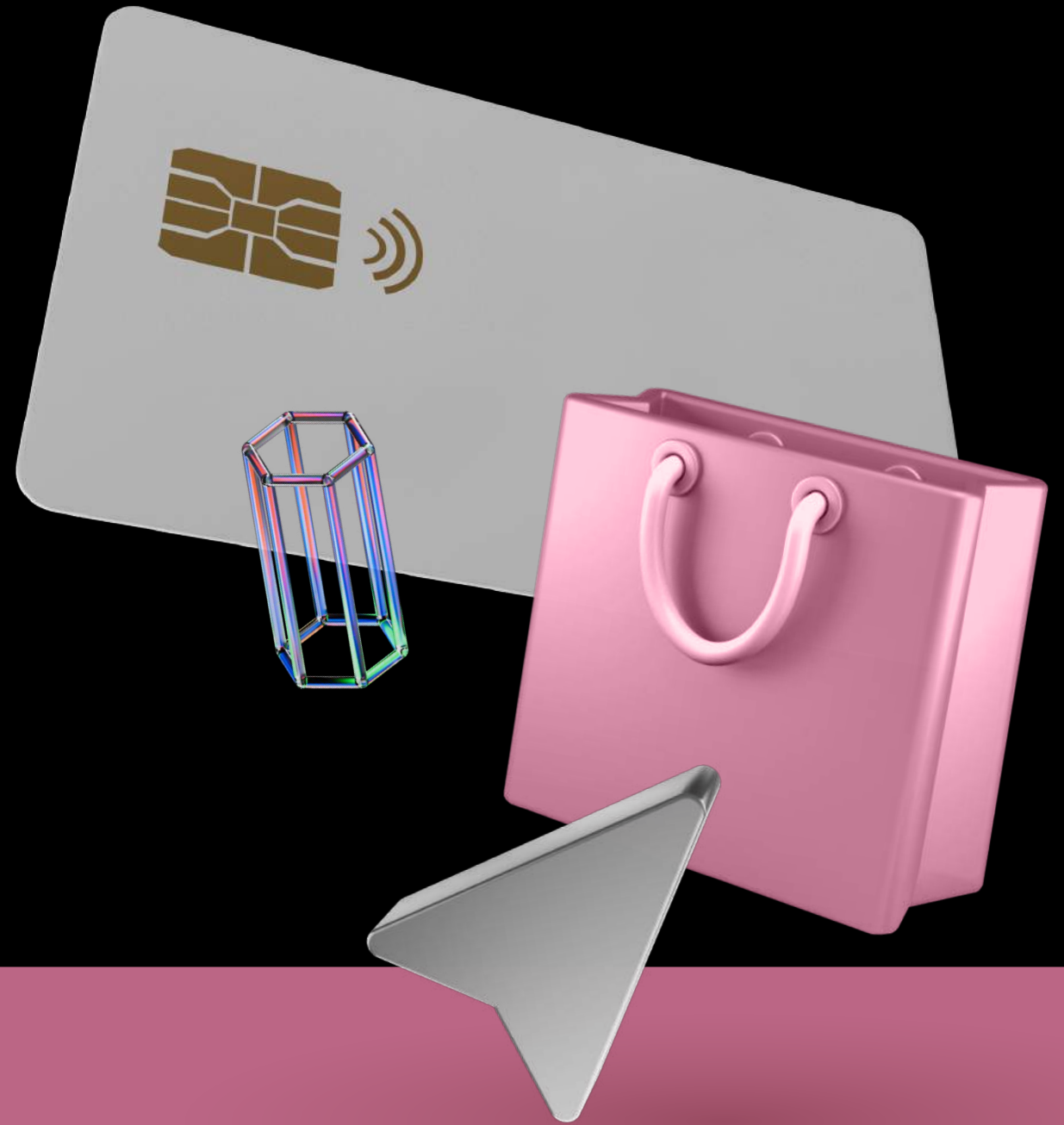
Assessment of the reliability and safety of instant messaging services among Ukrainians shows that **Signal has the highest level of trust, while Viber, Messenger and Telegram are perceived as applications with the highest probability of data leakage.** These attitudes are prevalent among the adult population (18–70 years), as well as among people with hearing impairments (18–59 years old), but the attitudes to individual messaging services are different. There are certain age-specific features in the assessment of the reliability of services. The younger age groups (from 18 to 39 years) have the highest level of mistrust to an individual messaging service, while the older population tends to express mistrust of all messaging programs at once.



Section

6

# Online shopping experiences



# Online shopping experiences

Over the past 2 years, there has been an increase in the share of the population that made online purchases. The biggest growth – 13% – is observed among teenagers (10–17 years old). In 2021, 44% teenagers had experience of online shopping). Among the population aged 18 to 70, the share increased by 9% (54% in 2021). The smallest change in online shopping was among people with hearing impairments, with an increase of 2%. Shopping practices are influenced by age, with the largest share of online shoppers among 18-29 year olds, and with each successive cohort, the share of online shoppers declines. Unlike age, sex does not affect the particularities of online shopping. Online shopping experience is expected to be influenced by the level of digital skills and financial situation. Among people with higher levels of digital skills and higher incomes, the proportion of online shoppers is higher.

## Internet commerce among target audience

Target audience	Target audience	Experience is not available
👤 Adult population	62,4%	37,6%
👤 Population with hearing impairments	66,3%	35,7%
👤 Adolescents	57,2%	42,8%

## Internet commerce by macroregion

Macroregions	👤 Adult population	👤 Population with hearing impairments	👤 Adolescents
West	64,6%	65,8%	53,7%
South	56,7%	58,7%	67,3%
North	65,1%	68,6%	54,4%
East	63,4%	68,3%	66,7%
Center	56,9%	69,4%	49,1%

## Online shopping practices of the target groups

### Number of types of products bought online

Options	👤 Adult population	👤 Population with hearing impairments	👤 Adolescents
One good	31,9%	29,1%	36,2%
2 types of goods	23,4%	14,9%	19,3%
3 types of goods	14,8%	11,2%	11,9%
Average number of product types ordered online	3	4	3

**Ukrainian adults, in particular people with hearing impairments, use the Internet the most to buy:**

- 👤 household goods;
- 👤 clothing, in particular sports clothing;
- 👤 making regular payments (mobile top-up, payment for Internet, utilities, etc.).

The former two categories of goods are among the leaders of online shopping by teenagers. Also, the teenagers also make regular online payments associated with computer equipment, games, software and electronic equipment, appliances. Online shopping practices of the target groups differ, although that at first glance they are similar. Notably, people with hearing impairments use online shopping more than others to make their life easier. This is indicated by a relatively higher rate of users with regular payments, the experience of buying household goods, food and transport tickets.

Almost three in four teenagers (73%) have experience shopping for clothes online. Among adults, this indicator is 16% lower and stands at 57%. There have been no significant changes in the categories of goods purchased by Ukrainians in the past 2 years. Among the adult population, more people began to buy medicines (+13%) and electronic devices (+5%) online.

## Goods and services were purchased or ordered online for personal use in the last 12 months

\*Multiple response questions

Options	👤 Adult population	👂 Population with hearing impairments	👧 Adolescents
Household goods	57,8%	67,9%	45,4%
Clothing, including sportswear	56,8%	47,0%	72,5%
Regular payments	37,0%	54,9%	23,9%
Medicine	30,1%	34,3%	9,6%
Electronic equipment and appliances	22,8%	30,2%	21,1%
Food	19,6%	31,0%	18,3%
Ordering tickets for transport	18,2%	30,2%	11,9%
Computers	15,2%	23,5%	24,3%
Movies and music	10,1%	14,2%	18,8%
Order tickets for various events	9,9%	13,4%	12,4%
Military equipment, headset, etc	8,5%	3,0%	5,0%
Materials for online learning	7,6%	11,6%	8,7%
Games, software	7,4%	13,8%	24,3%
Newspapers, magazines, books	5,8%	10,4%	6,9%
Housing order	3,5%	7,1%	1,4%
Other	3,7%	4,5%	2,3%

9 in 10 Ukrainians who buy goods online pay attention to the manufacturer. In this context, no significant age differences were found, a single pattern of consumer behavior was observed among buyers of different ages.

Since this question was not considered in detail within the scope of the study, it is impossible to determine which criteria are significant for consumers when choosing the goods of a certain manufacturer.

Section

# 7

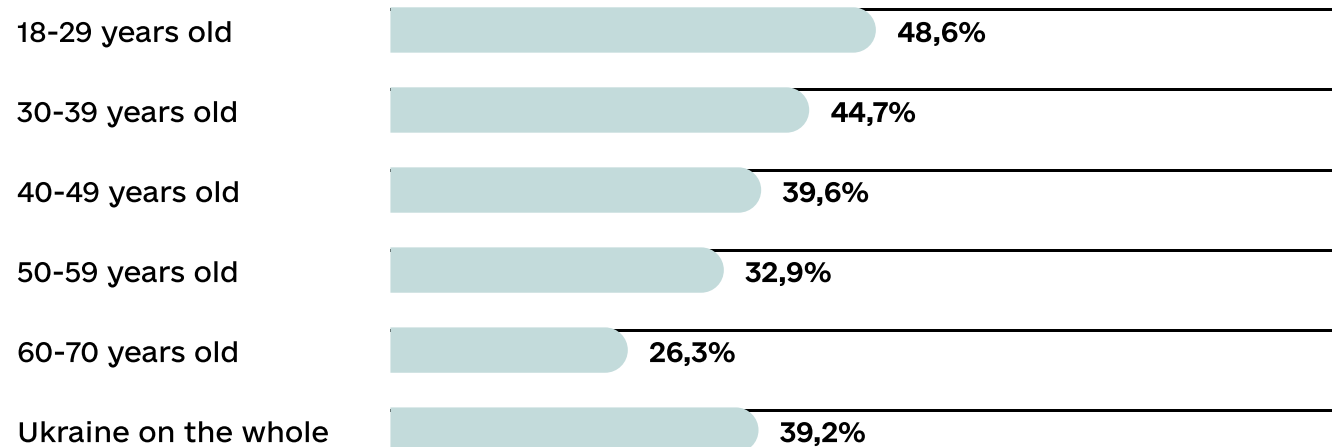
## Use of online services and recommendations





The development of online services provided by the government and local institutions is becoming a key tool for ensuring access to public services, especially during high-intensity migration processes within and outside the country. In particular, over the last two years, there has been a 4% increase in the number of users of electronic services among the adult population (18–70 years old). We observe somewhat different dynamics among the people with hearing impairments: the share of those who used online services decreased by 11% over the last year. It can be assumed that this drop is related to the specifics of the region of residence, because in the previous wave (in 2021), the eastern and southern macro-regions (which are currently temporarily partially occupied and have a difficult security situation) were featured by the highest rates of using online services (55% and 63%, respectively), and in 2023, these values decreased by 28% and 31%, respectively.

#### 👤 Using electronic services among the adult population in the last 12 months



#### Using electronic services among the adult population in the last 12 months by macro region

Macroregions	👤 Adult population	👤 Population with hearing impairments
West	37,7%	30,3%
South	34,7%	34,9%
North	38,8%	38,8%
East	46,3%	23,5%
Centre	36,3%	29,0%

The frequency of use of online services shows a negative correlation with the age of the respondents – that is, younger respondents report using such services more actively than older groups. It is obvious that the opportunities to receive services online are more actively used by the groups having basic and above basic digital skills.

#### Reasons for not using online services in the last 12 months

Reasons	👤 Adult population	👤 Population with hearing impairments
Lack of need	86,8%	59,3%
Did not know about this opportunity	10,5%	15,3%
Do not know how to use the online service	1,2%	7,6%
Do not understand how it works	1,9%	6,5%
A difficult procedure for me	2,4%	6,5%
Unsure of the reliability of online resources	1,8%	2,9%
Can not control the progress of the service	0,3%	1,5%
Services I need are not available online	1,2%	0,7%
Do not have access to the internet	0,5%	0,4%
Other	0,2%	1,1%
Hard to say	2,0%	14,2%

It is worth emphasizing that population may perceive certain services provided by the government or local institutions as non-online services (for example, services provided in the Diia application). It may affect overall assessment of this experience.

The reasons for not using online services reported by the respondents show that it is mainly about having no need to contact the government or local institutions rather than about barriers that prevent people from receiving public services without leaving their home.

# Recommendations

This section describes key proposals for possible changes in the domains within the scope of the study.

## Digital security

According to the [article](#) in Forbes Ukraine, the losses of Ukrainians from cybercrime in 2022 amounted to UAH 1 billion. In addition, the average amount of one fraudulent transaction increased by 49% to UAH 7,900. According to the [EMA Association of Members of Payment Systems](#), fraudsters most often used cash payments from the state, international organizations, well-known Ukrainian companies and banks as a bait. It is obvious that the war only increases the challenges related to information security and digital hygiene.

According to the study findings, 60% adults (ages 18–70) experienced at least one data breach in a 12-month period. Compared to 2021, 14% more respondents reported such experience in 2023. Teenagers are exposed to cybercrimes even more often – 8 in 10 teenagers report that their data security has been breached on the Internet.

In the process of study, possible areas for growth in the field of digital security of Ukrainians were identified.

### 1. Unpacking policies and technologies of personal data protection at the national level

On the one hand, digitization of public services simplifies the process of obtaining them. But on the other hand, it causes users to worry about the security of personal data. The latter can be a serious barrier to further development of electronic tools of a citizen-state interaction.

For example, the participants of the FGDs reported that currently information about a person is stored in various registers and can be accessed on the Internet. Because of this, the users feel vulnerable, “in full view.”

Representatives of the elderly show even more concern about how their personal information is stored and shared, how it is protected, etc. In addition, this age group generally has a lower level of digital skills and is less able to recognize threats related to data security, so they are more likely to become victims of cybercriminals. The mistrust to electronic services may be the result of limited understanding of how the data security system is organized at the government level. A possible solution is an information campaign that will demonstrate that data protection is taken responsibly – the risks of leakage are minimal or absent.

Within this campaign, there may be a targeted component aimed at the elderly, which will include television as a distribution channel. The focus can be on “two sides of security:” how the government protects your data and how you can protect yourself from cybercriminals.

## **2. Development of a standard data security policy for SMEs and community institutions (schools, hospitals, etc.)**

The study showed that more than one in three Ukrainians (36%) do not have policies on cyber security and/or cyber hygiene at the workplace, and one in four (26%) says there are no effective measures to protect confidential information.

At the focus group discussions, doctors and teachers emphasized that they interact with personal data as part of their professional activities. However, they do not have proper data security policies in the institutions where they work. It is obvious that this problem is typical for municipally owned enterprises and community institutions, as well as for small and medium-sized businesses. A possible solution would be the development of standard digital security policies for MOEs and small and medium-sized businesses. In combination with employee training, this will help reduce the risks of improper processing of personal data and contribute to strengthened information security at workplaces in general.

## **3. Development of data security practices at the individual level**

In addition to the focus on cybersecurity at the national and organization level, individual information processing practices, particularly among teenagers, need attention.

The study showcased that about one in three teenagers (31%) do not know how to protect their data when using the Internet, and 35% of the surveyed teenagers consider their digital skills not good enough. In rural areas, respondents aged 10–17 show even greater concern about their skills in using digital technologies and their ability to counter cyber threats.

Since teenagers are the most active users of the Internet, it is important that safe usage practices are established before they reach the age of adolescence. In view of this, it is proposed that digital security training be provided at primary school, based on computer science, security and life safety and other courses. However, the very format of teaching cyber hygiene should be more modern and make sure that the digital security values are promoted regardless of the child's area of residence or the individual teaching practices. For example, it can be a video/series/podcast recorded by a public opinion leader – a blogger, an actor, a musician, etc. In addition, children's education will generate positive effects for the adults, since teenagers often act as guides to the world of digital technologies for the older generation, especially grandparents.

## **4. Targeted programs to overcome digital inequality**

93% of Ukrainian adults have digital skills in general. At the same time, the skills of a third of the respondents (33%) correspond to the minimum level ("low skills") and almost the same share (38%) has the level of "above basic skills", which is the maximum on this rating scale.

**To reduce the digital divide, the focus should be on:**

- 👤 people of elegant age (60+);
- 👤 temporarily unemployed people without higher education;
- 👤 representatives of professions that do not involve the use of digital technologies, etc.

### 5. Digital literacy among children

A separate focus of the strategy to reduce the digital divide should be teenagers and children of primary school age. For them, the development of digital skills should be integrated into school education, as well as programs and activities aimed at the formation of certain competencies, where digital technologies are auxiliary tools. For example, the development of communication skills, in particular the etiquette of online communication or methods of combating stress and anxiety, including the use of specialized applications.




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