

Navigating digital competence: young people and AI technology expansion

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Abstract. The article presents the results of an empirical study of the level of digital literacy of young people in the Republic of Tatarstan in the conditions of digital transformation of all spheres of society. Special attention is paid to the technical and consumer digital literacy of young people, as well as their activity in the use of services and technologies based on artificial intelligence. The study shows that most young people are not sufficiently familiar with artificial intelligence technologies and overestimate their level of digital literacy in the field of security and application of information technologies to solve their everyday and professional tasks, which emphasizes the relevance of the issue and indicates the need to improve the level of digital literacy of young people. Data analysis allows us to identify key trends and patterns that are important to consider when developing educational programs and strategies aimed at improving digital literacy of young people, taking into account

1 Introduction

With the rapid development of artificial intelligence (AI)-based technologies, the digital competence of young people is becoming a key factor for successful adaptation to modern challenges [1-2]. Digital technologies penetrate into all spheres of life, changing the usual models of behavior and interaction [3-4]. In this context, the study of the level of digital activity of young people and their competence in the use of digital services based on AI is of particular relevance [5-6].

Let us define digital activity and digital competence. Digital activity - This is the use of digital technologies and tools to perform tasks, exchange information and interact with others through the network, including online communication, creating and distributing content, making financial transactions and other. Digital competency is a set of skills and knowledge to interact effectively with digital devices and technologies, navigate online environments, stay safe online, and critically evaluate and use digital information.

Digital competence includes four levels: information and media competence, communication competence, technical competence, and consumer competence [7-8]. This article will focus on assessing the technical and consumer digital competence of young people, as it is these levels of competence that play a key role in adapting to new technologies and using them effectively [9-10].

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Technical competence enables the safe and effective use of information and communication technologies (ICTs) for various tasks [11]. This level of digital competence includes the ability to recover digital content, the ability to manage access of applications and services to geo-position, microphone, internal device memory and other, the ability to recognize suspicious content, the ability to set up two-factor authentication to access accounts[12]. Consumer competence implies the knowledge, skills and abilities to successfully and safely solve everyday consumer tasks with the help of ICT [13]. This level of digital competence includes the ability to search for solutions to technical problems on the Internet (computer performance, installing a computer program), the ability to work with macros and write simple applications to automate a task, translating audiovisual and textual content into another language, converting text to voice, and others [14].

With the proliferation of AI-based technologies, young people need to have the skills to safely and effectively use ICTs for various tasks, as well as the skills to successfully and safely solve everyday consumer tasks using ICTs [15].

The purpose of this study is to analyze the digital competence of young people in the Republic of Tatarstan using sociological research methods.

In this article the main conclusions of the conducted sociological research are presented, we discuss the existing trends in the field of digital competence of young people, and consider the problems and opportunities for the development of digital skills of young people in the era of digital transformation.

2 Materials and Methods

This article presents the results of the survey conducted as part of the sociological study of digital socialization of the residents of the Republic of Tatarstan in March-April 2023 on the basis of probability (random) sampling, which allowed to ensure the representativeness of the results.

Within the framework of the study, 1554 respondents covering various age groups were interviewed: 802 youth representatives aged 14-35, which is the key focus of this paper.

The questionnaire contained 48 questions covering various aspects of digital socialization. This article analyzes the results of answers to 5 questions concerning the use of AI-based services and technologies by young people, as well as the assessment of the level of their technical and consumer digital competence using two-dimensional tables.

3 Results

Let us consider the obtained results. Figure 1 shows the results of young people's answers to the question: "How often do you use the following artificial intelligence services (ChatGPT, Midjourney, Deepart io, DeepCode, etc.)". The question was closed with the possibility to choose only one answer option.

The pie chart presents data that show that the largest share of respondents, namely 43%, have never used AI-based services. This indicates insufficient familiarity of young people of the Republic of Tatarstan with AI technologies. 33% of young people rarely use services with artificial intelligence, which may indicate a lack of understanding of the advantages and opportunities of these technologies. Only 24% of young people often use services with artificial intelligence. It can be concluded that it is necessary to increase the level of digital competence of young people in this area.

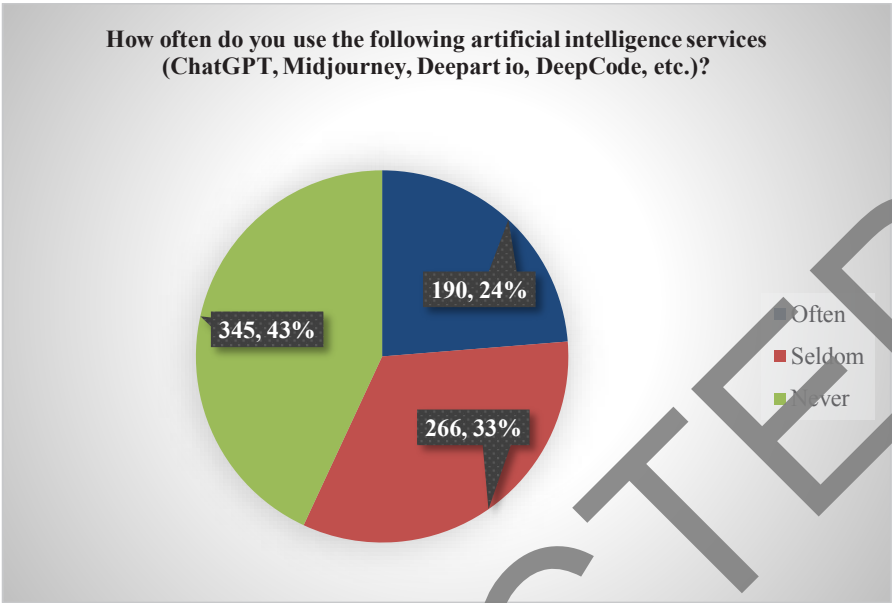


Fig. 1. Distribution of respondents' answers by frequency of use of artificial intelligence services (ChatGPT, Midjourney, Deepart io, DeepCode, etc.).

Let us conduct a comparative analysis of the digital activity of young people in the context of various digital services, including services based on artificial intelligence.

Figure 2 shows the results of young respondents' answers to the question “How often do you use the following online services?”. The question is closed, with a scale score for each of several answer options.

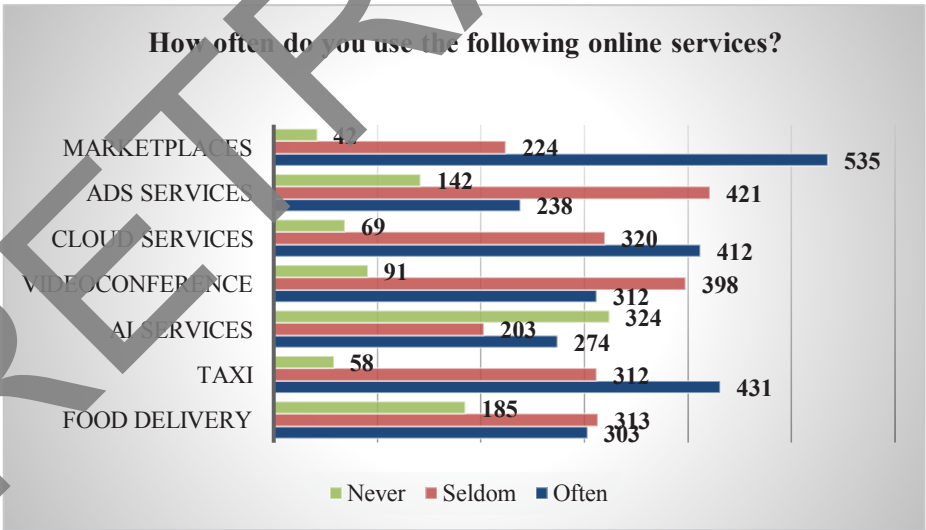


Fig. 2. Results of young respondents' answers to the question “How often do you use the following online services?”.

The analytical diagram shows that the highest user activity among young people when using such a group of online services as marketplaces (often - 535 respondents). Two groups of online services - cloud data storage and related offerings (412 respondents) and cab

services (431 respondents) - are next in the frequency of use ranking. Over 300 young people frequently use online services such as video conferencing services (312 respondents) and food delivery (303 respondents). Online service groups such as classifieds services (238 respondents) and artificial intelligence-enabled services (274 respondents) are frequently used by fewer than 300 but still more than 200 young people.

These data show that marketplaces are the most popular among young users, which may be due to their convenience and wide range of products. Cloud storage and cab services also have a significant place in the daily lives of young people, indicating the high degree of digitalization and mobility of this generation. Video conferencing and food delivery services are also very popular, which may be due to the changes in lifestyle and work patterns brought about by the COVID-19 pandemic. Announcement services and services using artificial intelligence, although less popular, still have a significant number of users, indicating their potential for growth and development in the future.

Table 1 presents the results of young respondents' answers to the main question "How would you rate your level of competence in ensuring your digital security?", taking into account their answers to the control question "What is two-factor authentication?" in order to test young people's knowledge.

Table 1. Distribution of the results of answers on young respondents' assessment of their competence level and their actual knowledge in the field of technical competence.

How would you rate your level of competence in ensuring your digital security?		What is two-factor authentication?	
		A method of identifying a user for logging into a digital service by confirming that he or she is the owner of the account in two different ways	Other incorrect answers
High / Rather high	A total of 398 respondents out of 801, or 49%	42%	58%
Average / Rather low / Low	A total of 403 respondents out of 801, or 51%	29%	71%

The bivariate table shows that 49% of total respondents rated their level of digital security competence as high or rather high, while 51% of respondents rated their level as medium, low or rather low. This data indicates that the perception of their own digital security competence among respondents is roughly evenly split between high and lower scores.

However, when analyzed in more detail, it was found that among the 398 respondents who rated their level of competence as high or rather high, only 42% answered the control question correctly. This suggests that a significant proportion of respondents who consider themselves competent in digital security actually lack knowledge. As for the respondents who rated their level of competence as medium, low or rather low, only 29% answered the control question correctly. This indicates that even those who recognize their limited knowledge of digital security also in reality lack the necessary skills and knowledge.

The findings show that there is a significant gap between respondents' self-assessment and their actual digital security knowledge. This emphasizes the need to improve digital literacy and competence of the population. In doing so, it is important not only to inform people about the ever-increasing level of cyberattacks, but also to provide them with practical knowledge and skills that will help them effectively protect their digital data and devices.

It was interesting to analyze the willingness of young people to share their knowledge with others and demonstrate their real digital practical skills to solve technical problems using

ready-made suggestions and advice from the internet. This distribution of responses can be seen in Table 2.

Table 2. Distribution of the results of the young people with digital skills' answers about the level of their readiness to help people in their environment to find ready-made technological solutions on the Internet to eliminate technical problems or to solve personal and professional tasks, based on their real digital competencies.

How would you rate your level of competence in problem solving in the digital environment?		Are you willing to help people in your community find ready-made technological solutions on the Internet that could help them solve technical problems, personal or professional challenges?	
		Yes / More like yes	Most likely not / No / Difficult to answer
High / Rather high	A total of 379 respondents out of 801, or 47%	47%	53%
Average / Rather low / Low	A total of 422 respondents out of 801, or 53 %	14%	86%

The analyzed table shows that the level of their competence in digital problem solving was rated as high or rather high by 47% of the total number of respondents, while 53% of the respondents rated their level as average, low or rather low. However, a closer analysis reveals that among those who rated their level of competence as high or rather high, only 47% responded positively to the control question. This suggests that a significant proportion of respondents who consider themselves competent at solving digital problems are not actually willing to help others. Interestingly, despite their average and low level of competence, there were still 14% of respondents who answered the test question positively. In general, this indicates that young people who recognize their limited knowledge of digital problem solving, in reality also lack the necessary skills and are not willing to help others.

Based on the research conducted, the following conclusions can be drawn:

- 1) the level of digital competence of young people (in particular, the technical level of digital competences) of the Republic of Tatarstan in the field of artificial intelligence and digital security is insufficient;
- 2) the majority of young people rarely use services with artificial intelligence, which indicates the need to improve their digital literacy and competence in this area;
- 3) analysis of respondents' answers to questions about digital security showed that many of them overestimate or underestimate their level of competence, indicating that there is a gap between self-assessment and actual digital security skills.

This could be due to several factors. First, there may not be enough emphasis on AI technology training in educational institutions, resulting in low awareness among young people. Second, young people may not be sufficiently informed about the benefits and possibilities of using AI in their daily lives and professional lives. Third, there are technical or financial barriers that limit young people's access to AI-based services.

This points to the need for additional educational programs and activities aimed at increasing digital literacy and competence among the population. It is important not only to inform people about the importance of addressing digital challenges, but also to provide them with practical knowledge and skills that will help them effectively cope with emerging challenges in the digital environment.

To address the identified challenges, comprehensive measures should be taken: 1) introducing AI courses and programs in educational institutions that will make it possible for young people to acquire basic knowledge and skills in this area; 2) conducting information campaigns and activities aimed at raising awareness of the benefits and possibilities of using

AI, which will promote interest in these technologies; 3) developing and providing accessible AI-based resources and services that can be used by young people.

4 Discussion

One promising area for future research is to examine the effectiveness of digital competence interventions targeting different age groups in the Republic of Tatarstan. These interventions could be designed to improve critical digital skills such as information evaluation, online safety, and digital communication. Longitudinal studies to assess the long-term impact of such measures on people's digital socialization and competence levels can provide valuable information.

Comparative studies of the Republic of Tatarstan and other regions or countries with different sociocultural backgrounds can shed light on the unique challenges and opportunities for increasing digital competence. Understanding how cultural factors influence the adoption of digital technologies and the development of digital competence skills can help in designing culturally sensitive interventions.

Research on the state of the technology infrastructure in the Republic of Tatarstan is critical. Research could focus on assessing the availability and accessibility of digital tools and Internet connectivity, especially in rural and underserved areas. Identifying gaps in access can help management target investments to address these disparities and promote digital inclusion.

To emphasize the social importance of digital competence, future research can delve deeper into the correlation between people's level of digital competence and their socioeconomic status. Research on how digital skills development contributes to employment opportunities, and its impact on income levels and overall quality of life, can provide compelling evidence on the importance of digital competence initiatives.

Creating customized educational resources and curricula that meet the specific needs and interests of the population of the Republic of Tatarstan is an area of research worth exploring. This includes the development of online courses, tutorials, and digital educational content that resonate with local culture and languages.

Finally, it is critical to understand the role of the public and private sectors in promoting digital competence and socialization. Research can explore partnerships between government agencies, educational institutions, and technology companies to assess the effectiveness of collaborative initiatives to promote digital skills and engagement.

5 Conclusions

This article analyzed the level of digital competence of young people in the Republic of Tatarstan in the context of the spread of artificial intelligence (AI)-based technologies. The main findings of the study showed that young people in Tatarstan show low activity in the use of AI-based services and technologies. In addition, the level of their technical and consumer digital competence was low both in terms of self-assessment and correctness of answers to control questions.

These results underscore the need to strengthen educational programs and initiatives aimed at improving digital literacy among youth. It is important to develop and implement programs that will encourage more active and informed use of AI-based technologies. This can include both formal education in schools and universities as well as informal activities such as trainings, seminars and workshops.

Despite the limitations of the study, such as the use of self-reported data and the limited time frame of the survey, the findings are important for developing strategies to improve

digital competence. Additional research using a greater variety of data collection methods and outreach to different social and geographic groups is recommended.

Thus, this study emphasizes the importance of continuous monitoring and analysis of the level of digital competence of young people. Only through systematic work and the implementation of effective educational programs can young people be prepared to live and work in a digital society.

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