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Research Article

THE INTERNET COVERAGE IN UZBEKISTAN SERVES AS A PRIMARY SOURCE OF INFORMATION FOR THE FOURTH INDUSTRIAL REVOLUTION

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ABSTRACT

This article explores Uzbekistan's recognition of the significance of the fourth industrial revolution and the crucial role of internet connectivity in integrating transformative technologies such as AI, big data, cloud computing, and IoT. The country has made substantial investments in technology and infrastructure to support this revolution. However, this article goes beyond the emphasis on quantity and delves into the importance of fostering quality internet users and improving internet coverage in Uzbekistan. By focusing on both the quantity and quality of internet access, Uzbekistan aims to create an environment conducive to innovation, entrepreneurship, and digital skills development. The analysis presented in this article sheds light on the country's efforts to maximize the benefits of the digital economy by ensuring widespread and reliable internet access, empowering individuals with digital literacy, and fostering a competitive position in the global digital landscape.

KEYWORDS

Digital economy, fixed (wired) narrowband network, mobile internet.

INTRODUCTION

The internet coverage in Uzbekistan is relatively lower compared to more successful countries, as indicated by official statistical data analysis. While specific statistics for Uzbekistan are not provided in this context, it is important to note that widespread and reliable internet access is a key factor in driving the success of the fourth industrial revolution. Countries with higher internet coverage tend to have a greater ability to fully utilize emerging technologies and participate in the digital economy.

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To further understand and compare the internet coverage in Uzbekistan with more successful countries, it would be beneficial to examine official statistical data specifically related to internet penetration rates, broadband availability, and connectivity infrastructure. This data would provide insights into the current state of internet coverage in Uzbekistan and allow for a meaningful comparison with countries that have achieved higher levels of success in harnessing the benefits of the fourth industrial revolution.

By analyzing such data, policymakers and stakeholders can identify areas for improvement, devise strategies to expand internet coverage, and bridge the digital divide, thereby enabling Uzbekistan to enhance its participation in the fourth industrial revolution and drive economic growth and innovation.

Research and Methodology:

1) the analysis and synthesis method is employed to examine the availability and usage of the internet in developing Uzbekistan's digital economy.

2) Scientific abstraction, induction, and deduction are utilized in research to compare similarities between different countries and analyze research outcomes from scientists.

3) The abstract-logical approach is utilized to theoretically generalize the research findings and formulate conclusions.

4) Mathematical and statistical processing of research results involves analyzing the collected data through various techniques such as ranking, scaling, registration, systematization, differentiation, grouping, and graphical representation.

The World Bank has recommended the improvement of Information and Communication Technology (ICT) skills across all industries due to the discovery that a 10% rise in internet connectivity leads to a 1.38% increase in GDP growth. Similarly, the OECD has argued that high rates of internet access result in a 2% boost in GDP. Because the internet has a positive impact on economic growth, we conducted a study in Mexico to examine the relationship between the economically active population, human capital, and technology, and assess these effects. We analyzed a data series spanning from 1991 to 2010 using the least-squares method in three stages. We considered a Cobb-Douglas function within the Solow model. The findings indicated that technology and internet access have a positive influence on high-level students and graduate students, thereby contributing to the global innovation index [1].

There is a lack of sufficient empirical evidence on the effects of internet usage in promoting self-employment in rural communities, although a few studies have explored this topic.

Graph 1. Ratio of internet use in urban areas to internet use in rural areas

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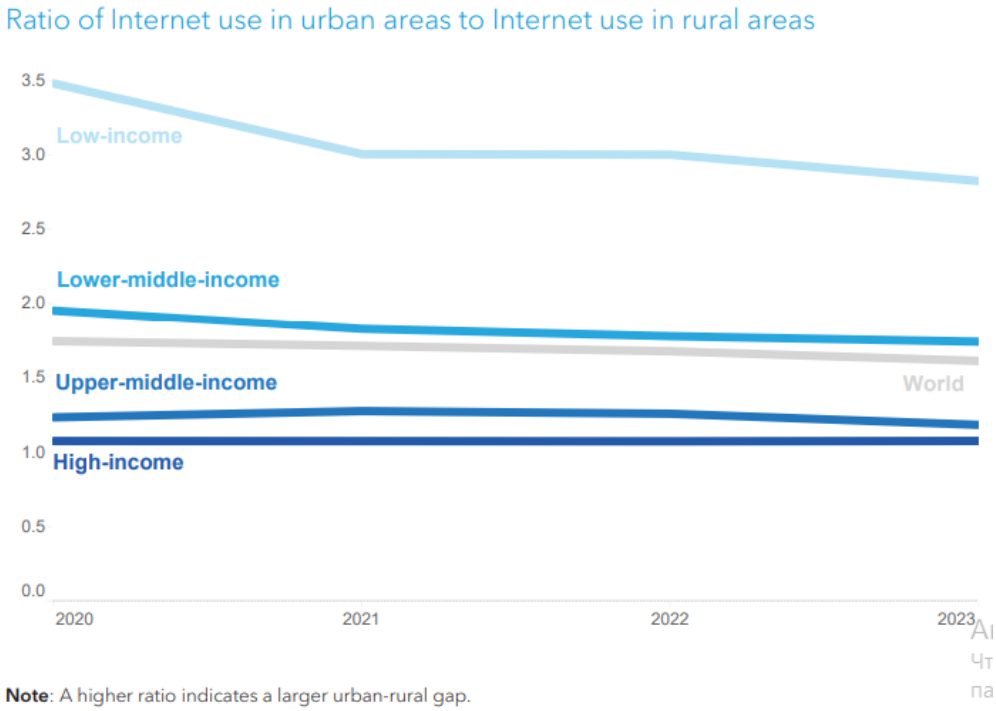

Source: the UN specialized agency for ICTs [11]

However, one potential benefit identified is that internet usage can enhance access to credit, which in turn has the potential to stimulate self-employment opportunities in rural areas. [2], Increased social engagement [3] and reduced transaction costs [4]. There is a limited amount of empirical data available that examines the impact of internet usage in fostering self-employment in rural communities. However, in comparison to not using the internet, using the internet has been found to significantly increase the likelihood of rural self-employment by 5 to 7 percentage points. The analysis of different groups shows that internet usage has a notable effect on self-employment for male, older, and higher-educated rural workers, while the impact on female, younger, and less-educated workers is not particularly remarkable. [5].

The gap between urban and rural areas varies significantly across income groups. The gap has almost been bridged in high income countries (ratio of 1.1). In contrast, the divide remains deep in low-income countries: less than one in five people (17 per cent) living in rural areas in these countries use the Internet. People living in urban areas are nearly three times more likely to use the Internet. That shows that the digital divide across income groups is magnified 7 Measuring digital development Facts and Figures 2023 in rural areas. The Internet use gap between urban areas of low-income and urban areas of high-income countries is 48 percentage points. The Internet use gap is 71 percentage points between the rural areas of the two groups[12]. Statistics specific to Uzbekistan in this field are not provided. However, it is reasonable to assume that global statistics apply to all countries, including Uzbekistan.

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A study conducted by Peter S. Davis and Paula D. Harveston (2000) discovered that internet technology had a favorable effect on the internationalization and sales growth of entrepreneur-led family businesses. The research also revealed that a stronger focus on technology investments was associated with more extensive internationalization among these types of businesses. [6].

According to Decree #158, issued by the President of the Republic of Uzbekistan on September 11, 2023, our country has devised plans to achieve specific goals in the digital sector and the wider digital economy. [7] To successfully achieve the goals set forth in the "Uzbekistan - 2030" strategy, it is essential to prioritize widespread fixed internet coverage. This will enable effective engagement and utilization of the abundant talent pool throughout the country, including both urban and rural areas. It is noteworthy that around 51% of the population in Uzbekistan resides in urban areas, while the remaining 49% live in rural regions [8], it is crucial to recognize that supplying internet access in urban areas can be more expensive due to costs associated with cable infrastructure and difficulties like electricity shortages. Nevertheless, it is praiseworthy that authorities have been actively addressing these challenges and making efforts to overcome them.

Table 1. The share of households in the Republic of Uzbekistan with access to the Internet, by type of services (according to the sample survey of households, as a percentage).

Series Name	2018	2019	change %	2020	change %	2021	change %	2022	change %
Fixed (wired) narrowband network	1,1	0,6	*54,5*	0,6	*100*	1	*166,7*	1,2	*120,0*
Fixed (wired) broadband network	2,4	0,3	*12,5*	1,2	*400,0*	1,8	*150,0*	3,6	*200,0*
Terrestrial fixed (wireless) broadband network	5,3	6,6	*124,5*	8,1	*122,7*	11,7	*144,4*	13,9	*118,8*
Satellite broadband network (via satellite communication)	0	4,9	*n/a*	5,1	*104,1*	3,6	*70,6*	3,3	*91,7*
Mobile broadband network using a portable device	68,2	84,2	*123,5*	86,1	*102,3*	78,3	*90,9*	85,7	*109,5*
Mobile broadband network using an integrated SIM card in a computer or USB modem	9,7	1,6	*16,5*	0,2	*12,5*	6,6	*3300,0*	6,7	*101,5*

Source: compiled by the authors [9]

If Table 1 depicts a positive upward trend in both wired and mobile internet coverage among the population, it signifies progress in expanding access to internet services. This growth is promising as it suggests that more individuals are gaining connectivity and reaping the benefits of internet access. However, it may be premature to make econometric predictions solely based on the available data. Nonetheless, considering existing research and assumptions, it is reasonable to expect continued growth in the digital economy. The expansion of fixed internet access to a larger portion of the population can contribute to this growth by facilitating increased connectivity and participation in digital activities. This expanded access has the

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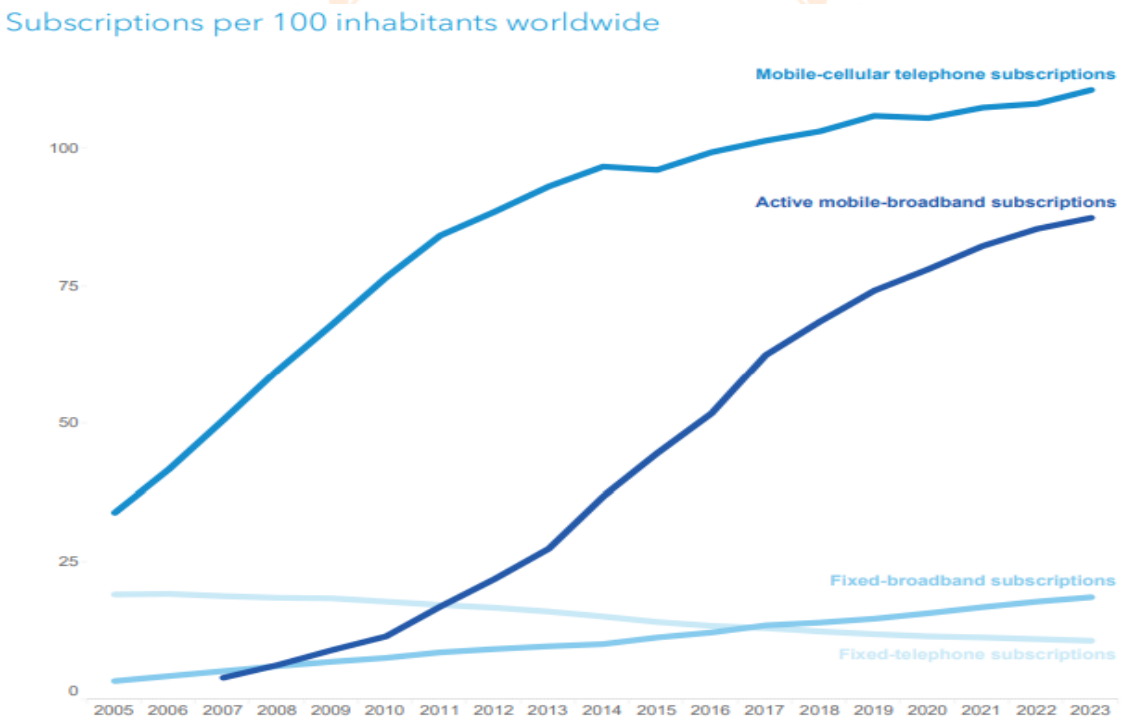
potential to drive exponential growth in the digital economy, although further analysis would be necessary to validate this assumption.

According to statistics from graph 2, global fixed broadband coverage is nearing 25%. However, in Uzbekistan, both narrowband and broadband coverage are relatively low at around 5%, as indicated in table 1. This limited internet coverage in Uzbekistan could be a significant contributing factor to the overall low adoption and utilization of the fourth industrial revolution technologies in the country.

There is ample opportunity to expand access to high-speed internet and bridge the digital divide. By investing in digital infrastructure, improving connectivity in rural areas, and implementing policies that promote internet accessibility, Uzbekistan can create an environment conducive to the widespread adoption of transformative technologies. This, in turn, will drive economic growth, foster innovation, and enable the country to fully leverage the benefits of the fourth industrial revolution.

Graph 2. Subscriptions per 100 inhabitants worldwide.



Source: the UN specialized agency for ICTs [11]

Based on statistics from the UN specialized agency for ICTs (graph 3), it can be observed that internet usage in Uzbekistan is higher than the global average. However, when considering fixed broadband usage specifically, it is lower compared to upper-middle-income and high-income countries, as well as below the world average (graph 4).

Graph 3. Individuals using the internet

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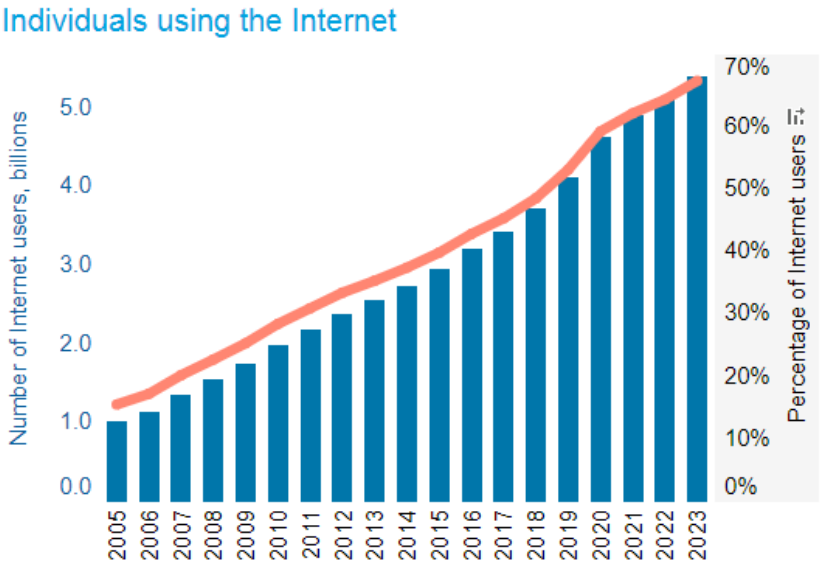
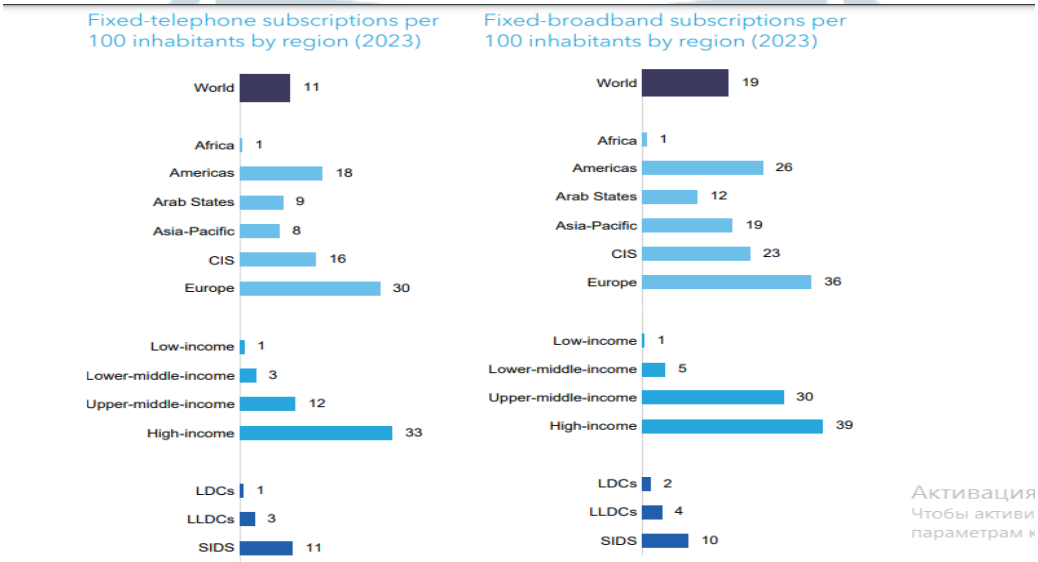


Source: the UN specialized agency for ICTs [11]

This lower level of fixed broadband usage can have implications for the efficiency of internet usage in Uzbekistan. For example, programming compilers such as Visual Studio and Android Studio often require constant online connections. The lower participation of programmers in Uzbekistan, as indicated by the lower fixed broadband usage, may present challenges in terms of accessing and utilizing these tools effectively. To promote more efficient internet usage and encourage greater participation in programming and related fields, efforts should be made to expand and improve fixed broadband infrastructure in Uzbekistan.

Graph 4. Fixed-telephone and fixed-broadband subscriptions per 100 inhabitants by region (2023)



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Source: the UN specialized agency for ICTs [11]

Although there is a lack of specific statistics regarding the emigration or immigration of IT specialists, the growing number of IT products and services serves as an indication of sectoral growth. The increasing demand for IT products and services implies a flourishing market and a requirement for skilled professionals to develop and deliver these offerings.

Table 2. The volume of rendered market communication and informatization services (in actual prices, billion soums)

Indicators	2020	2021	change %	2022	change %
programming and broadcasting services	650,9	696,7	*107,0*	833,1	*119,6*
telecommunication services	10 233,70	11 957,30	*116,8*	14 660,70	*122,6*
computer programming services, consulting and other related services	1 428,20	2 721,50	*190,6*	4 652,90	*171,0*
information services	708,7	1 373,60	*193,8*	2 516,00	*183,2*

Source: compiled by the authors [9]

It is reasonable to speculate that the expansion of the digital economy and the proliferation of IT products and services may attract and retain IT specialists within the country, while also potentially drawing talent from overseas. However, without precise data on emigration and immigration trends, it is difficult to provide a comprehensive evaluation of the situation (Table 2 and Table 3).

Table 3. Number of active organizations by types of economic activity "Information and Communication" (as of January 1, 2023, units).

Industries	2021	2022	change %	2023	change %
Release of computer games	136	130	*95,6*	156	*120,0*
Release of other software	315	352	*111,7*	425	*120,7*
Computer programming activities	896	1121	*125,1*	1618	*144,3*
Consulting services in the field of computer technology	387	461	*119,1*	536	*116,3*
Computer equipment management activities	198	243	*122,7*	290	*119,3*
Other activities in the field of information technology and computer systems	1 433	1 596	*111,4*	1 993	*124,9*
Data placement and processing services	510	628	*123,1*	704	*112,1*

Source: compiled by the authors [9]

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The success of a vibrant digital economy hinges on the presence of robust infrastructure and a proficient workforce that encompasses a blend of IT expertise and business or economics acumen. The fusion of technical knowledge and business acumen plays a pivotal role in utilizing technology to stimulate innovation, establish new ventures, and promote economic growth.

A strong digital infrastructure, which encompasses dependable internet connectivity, advanced telecommunications networks, and secure data storage systems, serves as the fundamental basis for digital economic endeavors. It enables businesses to operate with efficiency, facilitates the smooth functioning of e-commerce, and supports the creation and provision of digital products and services.

Table 4. E-commerce includes the sale of products (goods, works, services) under contracts concluded using information systems, including through an offer, exchanges and auctions, as well as using other electronic trading platforms. (for 2022 preliminary data).

Indicators	2020	2021	change %	2022	change %
Sector of information economy and e-commerce	10 777,00	16 939,50	*157,2*	27 791,20	*164,1*
Sector of information and communication technologies (ICT)	9 095,90	11 567,60	*127,2*	16 089,90	*139,1*
ICT production	540,1	503,3	*93,2*	805,5	*160,0*
ICT trade	252,3	367,8	*145,8*	594	*161,5*
ICT services	8 303,50	10 696,40	*128,8*	14 690,40	*137,3*
Content sector and mass media	1 089,70	1 464,60	*134,4*	1 944,90	*132,8*
E-commerce	591,4	3 907,30	*660,7*	9 756,40	*249,7*

Source: compiled by the authors [9]

Moreover, it is vital to have specialists who possess a combination of IT skills and business or economics acumen. These professionals are capable of comprehending the technological landscape, identifying opportunities for digital transformation, and efficiently managing the intersection of technology and business strategies. Their expertise enables the development of innovative solutions, the implementation of effective digital business models, and the optimization of resource allocation to maximize the advantages offered by the digital economy..

By cultivating a conducive environment that fosters technological advancements and business acumen, nations can position themselves for success in the digital economy and capitalize on the opportunities it offers. This can be achieved through various measures, such as utilizing government and business management tools to ensure that internet access is affordable and treated as a necessity, making it price inelastic on the demand side. On the supply side, it is beneficial to promote price elasticity, making internet availability more accessible to consumers at all times.

Table 5. Statistical information on education and social spheres.

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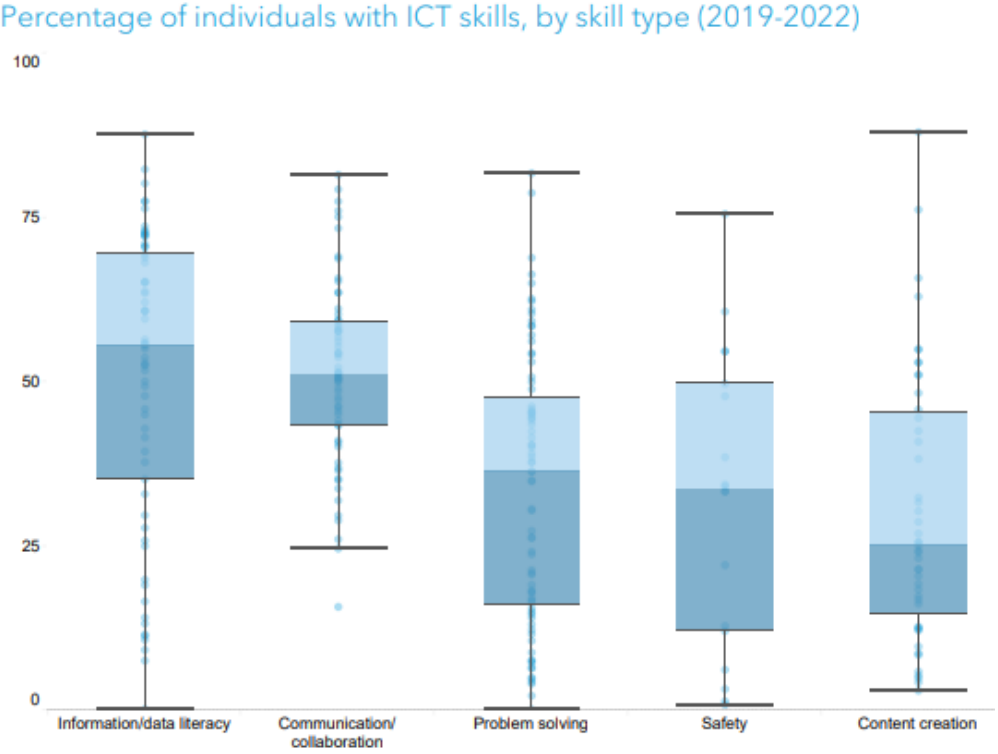
Sphere \ year	2021	2022	change %	2023	change %
Number of students enrolled in Business and management	19 906	30 756	154,5	26 569	86
Number of students enrolled in Information and communication technologies.	10 407	16 066	154,4	19 306	120

Source: compiled by the authors [10]

Despite the importance of digital skills in leveraging ICTs for economic prosperity and social well-being, data remain very scant. Only 83 countries submit data, and rarely for all skill areas. Based on this limited dataset, skills linked to information/data literacy are the most prevalent, with a median of 56 per cent and an average that lies between 33 and 69 per cent for most countries. Communication/collaboration is the second most prevalent (median of 51). Problem solving (36), safety (34), and content creation (25) follow with much lower medians [12].

Grpah 5 . Percentage of individuals with ICT skills, by skill type (2019-2022).



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Note: Bars indicate the 25th, median and 75th percentile of all country values. Bottom and top lines indicate minimum and maximum values. *Communication/collaboration* is the average of sending messages (e.g. e-mail, messaging service, SMS) with attached files; making calls over the Internet; participating in social networks; and taking part in consultation or voting via Internet. *Problem solving* is the average of finding, downloading, installing and configuring software; connecting and installing new devices; transferring files or applications between devices; electronic financial transactions; doing an online course; and purchasing or ordering goods or services. *Safety* is the average of changing privacy settings; and setting up effective security measures. *Digital content creation* is the average of using copy and paste tools; creating electronic presentations; using basic arithmetic formula in a spreadsheet; editing online text, spreadsheets, presentations; and uploading self/user-created content. *Information/data literacy* is the average of verifying the reliability of information; getting information about goods or services; reading or downloading newspapers, etc.; and seeking health-related information. Data availability: 64 countries for *communication/collaboration*, 80 countries for *problem solving*, 18 countries for *safety*, 47 countries for *content creation*, and 65 countries for *information/data literacy*. In-scope ages may vary between countries.

Source: the UN specialized agency for ICTs [11]

The research conducted by the World Bank, which demonstrates a positive relationship between digital infrastructure and economic growth, reveals that a 10% increase in internet speed can result in a 2% increase in GDP. It is worth noting that these findings are based on a general trend and may differ in various contexts. Nevertheless, they indicate the potential economic advantages that can be derived from enhancing internet access and speed.

Given that internet coverage in Uzbekistan is currently below 10%, while mobile internet coverage has reached nearly 86%, there is substantial scope for expanding fixed internet coverage. This expansion holds the potential to fuel economic growth, both in rural and urban areas. Enhanced internet access can facilitate the development of online businesses, e-commerce platforms, digital services, and remote work opportunities, thereby fostering an environment conducive to self-employment and entrepreneurship.

CONCLUSION

For Uzbekistan to thrive in the ongoing fourth industrial revolution and leverage the internet coverage as a primary source of interconnection in the scientific world, it is crucial for the government to take decisive actions. These actions may include:

- Ensuring comprehensive coverage of fixed broadband internet in all areas by incentivizing private sector participation through subsidies and promotional initiatives. This would expand access to high-speed internet and bridge the digital divide.
- Promoting and supporting talented youth by providing subsidies and incentives for their education and skill development. This would encourage their active participation in technological fields and innovation, fostering a vibrant ecosystem of digital talent.
- Maximizing the efficient utilization of available resources by implementing effective policies and strategies. This could involve leveraging existing infrastructure, optimizing connectivity, and encouraging digital entrepreneurship.

By implementing these measures, Uzbekistan can establish a strong foundation for its participation in the fourth industrial revolution. This would enable the country to harness the potential of the digital economy, nurture innovation, and empower its youth to play a significant role in shaping the future of technology.

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