

# Connectivity in education

## Status and recent developments in nine non-European Union countries



In partnership with:



**Europe region**

**Connectivity in education:  
Status and recent  
developments in nine non-  
European Union countries**

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- Future Networks & Spectrum Management (Access) Division
- Regulatory and Market Environment Division
- ICT Data and Analytics Division

UNICEF Country Offices:

- Albania
- Georgia
- Montenegro
- Serbia
- Turkey
- Ukraine

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- Directorate of Policies and Development Strategies for Telecommunications and Posts of the Ministry of Infrastructure and Energy of Albania

- Communications Regulatory Agency of Bosnia and Herzegovina
- Directorate for Information Society and Digital Economy Policies and Regulations of the Ministry of Economy and Infrastructure of Moldova
- Radiocommunications Department of the Agency for Electronic Communications of North Macedonia
- Bureau for Education Development of the Ministry of Education and Science of North Macedonia
- Ministry of Education, Science and Technological Development of Serbia
- Ministry of Trade, Tourism and Telecommunications of Serbia
- Ministry of National Education of Turkey
- International Relations Department of the Information and Communication Technologies Authority of Turkey
- State Service for Special Communications and Information Protection of Ukraine
- Ministry of Education and Science of Ukraine.

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# Abbreviations

A4AI	Alliance for Affordable Internet
AEC	Agency for Electronic Communications of North Macedonia
AKEP	Electronic and Postal Communications Authority of Albania
AMRES	Academic Network of the Republic of Serbia
ANRCETI	National Regulatory Agency for Electronic Communications and Information Technology of Moldova
BDT	Telecommunication Development Bureau
BTK	Information and Communication Technologies Authority of Turkey
COVID-19	coronavirus disease 2019
EB	exabyte
EKIP	Agency for Electronic Communications and Postal Services of Montenegro
EMIS	education management information system
EU	European Union
FATİH	Movement to Enhance Opportunities and Improve Technology
Gbit/s	gigabit per second
GRENA	Georgian Research and Educational Networking Association
ICT	information and communication technology
INSTAT	Albanian National Institute of Statistics
ITU	International Telecommunication Union
Mbit/s	megabits per second
MEIS	Montenegrin Education Information System
MICS	Multiple Indicator Cluster Survey
NGO	non-governmental organization
OECD	Organisation for Economic Co-operation and Development
PC	personal computer
PISA	Programme for International Student Assessment
RATEL	Regulatory Agency for Electronic Communications and Postal Services of Serbia
RCPs	regional collaborative platforms
SDGs	Sustainable Development Goals

(continued)

SONCE	Roma Democratic Development Association
TURKSTAT	Turkish Statistical Institute
UIS	UNESCO Institute of Statistics
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFPA	United Nations Population Fund
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
WHO	World Health Organization
WLAN	wireless local area network

## 1 Introduction

### 1.1 The recent landscape

In recent years there has been widespread discussion in public institutions of Internet connectivity as a driver of digital transformation at country level. In the wake of the coronavirus disease 2019 (COVID-19) pandemic, this trend has increased as restrictions on freedom of movement have put pressure on public administrations to adapt through digitalization, just as the private sector has. Even before the World Health Organization's announcement of the pandemic in March 2020, however, the digitalization of government services had already been widely recognized as a priority to support a more user-friendly and efficient digital environment for the public at a lower cost.

Among public institutions, schools and various other organizations offering educational services have attracted particular attention in terms of Internet access over the past two years. School connectivity plays an essential role in strengthening education systems to be resilient to shocks and fit for the digital age. It can equip schools to ensure continuity in education service delivery, whether face-to-face or at a distance. It can enrich teaching and learning by providing access to high-quality learning content in line with school curricula, offer personalized learning pathways to achieve relevant learning outcomes, and support inclusion by enabling the use of assistive and adaptive technologies. Connectivity allows for better administration of the education system, from central or local government to the school itself, through the accurate and timely collection and sharing of data and the integration of education management information systems (EMISs). It can also drive innovative, local solutions for connecting all young people to the Internet and to high-quality learning and skills development. In order to respond to current and future demands for digital skills in the workplace, several countries around the world have been early adopters of policies aimed at elevating digital skills among the young population. However, such a vision requires adequate infrastructure at the school and country levels, including access to appropriate information and communication technology (ICT) devices and reliable connections to the Internet.

Lockdowns and other restrictive measures adopted by many governments in Europe and around the world have temporarily moved education from the classroom to the home environment, potentially overshadowing the need for action to improve ICT infrastructure and the quality of connectivity in schools. However, the shift has also forced the adoption of distance learning, often delivered digitally, which shines an important light on the untapped potential of digital technology to improve quality and equity in education. This has underscored the importance of ensuring high-quality, digitalized learning content, the availability of and access to appropriate devices, and the development of the digital skills necessary for both teachers and learners to thrive in the future. Underpinning the effectiveness of digital learning and its role in supporting the transition to a digital society is high-quality connectivity for schools, as well as for universities and centres of teacher professional development.

As the pandemic has highlighted the need to reimagine how learning is delivered and ensure that it can continue beyond traditional face-to-face teaching and learning episodes, it is critical to foster investment in this important area. Digitalizing education systems while expanding teachers' portfolios of competencies and students' daily learning processes towards the development of digital skills has become a policy imperative requiring partnership and resource mobilization in the coming years.

## 1.2 Purpose of the report

The countries of the European Union (EU) play a leadership role in school connectivity globally, which translates into both the efficient management and use of resources from a public administration perspective and the possibility of implementing educational policies that include digital skills development in curricula. Some non-EU countries in Europe, however, face multiple barriers in this regard, frequently characterized by the high costs of both network deployment and access to ICT equipment coupled with inadequately trained human capital, which often results in the lack of a sound strategic approach at national level.

In consideration of the above, nine countries have been identified as a priority in Europe: Albania, Bosnia and Herzegovina, Georgia, Moldova, Montenegro, North Macedonia, Serbia, Turkey and Ukraine. The International Telecommunication Union (ITU) and the United Nations Children's Fund (UNICEF) share the goal of ensuring that potential gaps –including in connectivity, skills, policy, and resources – in these nine countries are reduced substantially so as to create education systems that are fit for purpose and able to deliver the learning and skills development relevant to an increasingly digital society.

With the goal of accelerating these countries' digital transformation and supporting the attainment of the United Nations Sustainable Development Goals (SDGs), ITU and UNICEF seek to support governments in identifying persistent gaps in high-quality Internet connectivity for schools and to promote a favourable environment for investments in school connectivity and the infrastructure underpinning it by engaging with relevant stakeholders at local, regional and international level. This report's objective is to provide a holistic picture of the situation in each country, with a view to equipping national stakeholders with the necessary information to understand and address gaps and challenges and ensuring that education plays a key role in driving the digital transformation and vice versa. Identifying the key trends that characterize the interplay between the development of education systems and broadband connectivity development will provide all interested stakeholders, both within countries and across the region, with the necessary information for effective decision-making.

It is to this end, as part of the ITU Regional Initiative for Europe on broadband infrastructure, broadcasting and spectrum management and in support of the priorities of UNICEF's LearnIn initiative in Europe and Central Asia (which operationalizes the UNICEF global Reimagine Education initiative in the region), that the ITU Office for Europe and the UNICEF Regional Office for Europe and Central Asia have developed this background document to address the situation by offering a clearer picture of the status of many factors relating to school connectivity in selected non-EU countries of the European region.

## 1.3 ITU-UNICEF partnership

The ITU-UNICEF partnership was established in view of the organizations' converging policy domains and within the framework of continuing reforms to regional United Nations development systems. Specifically, work is conducted in accordance with the deliberations of the UN Digital Transformation Group for Europe and Central Asia (UNDTG4ECA). Given their shared vision of ensuring sustainable and resilient leveraging of ICTs for expanding access to and ameliorating the quality of education, ITU and UNICEF have joined forces in this uniquely regional partnership. Complementary mandates, as explained above, also make for a fruitful collaboration within the framework of regional collaborative platforms (RCPs).

The outcome of this cooperation is the creation of a regional knowledge public good that will not only serve as a status report on connectivity in the education systems of the nine countries the report covers, but also provide targeted options for the future activities of the two individual agencies and for interagency collaboration, initiatives and publications, focusing on the digital component in these countries.

## 1.4 Methodology

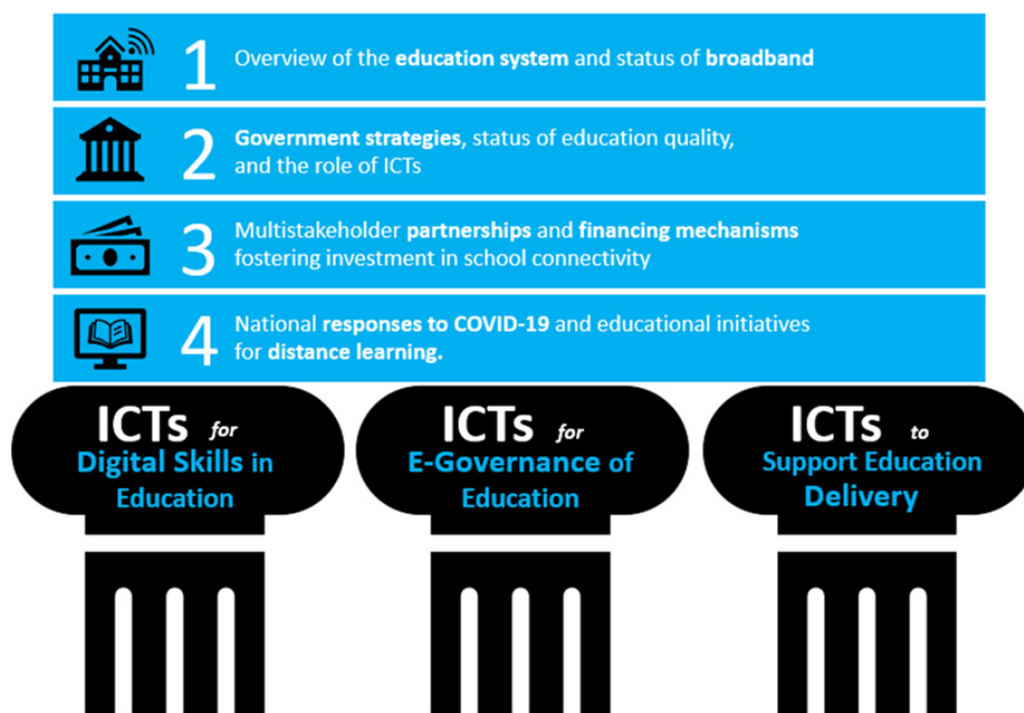
This background document is founded upon the contention that digital technologies play a central role in enhancing curricula, administering education systems and delivering instructional material. This reality was thrown into stark relief during the COVID-19 pandemic, with ICTs becoming a key component in the delivery of remote education to children and young people when in-person instruction was interrupted. Three aspects of the utility of ICTs in education underpin the report's exploration of connectivity in this sphere: (i) ICTs for digital skills in education; (ii) ICTs for e-governance of education; and (iii) ICTs to support education delivery, encompassing both distance learning at times when crises disrupt in-person learning and ICTs for the enhancement of learning through blended models.

The report contains two main chapters: one giving a regional overview, which pools country data to identify aggregate regional trends, and the other setting out nine country profiles, which provide an in-depth, country-level description of the situation in Albania, Bosnia and Herzegovina, Georgia, Moldova, Montenegro, North Macedonia, Serbia, Turkey and Ukraine.

Both the regional overview and the country profiles follow a standardized structure, consisting of the following sections:

- 1) Overview of the education system and status of broadband;
- 2) Government strategies, status of education quality, and the role of ICTs;
- 3) Multistakeholder partnerships and financing mechanisms fostering investment in school connectivity;
- 4) National responses to COVID-19 and educational initiatives for distance learning.

The report's methodological approach is outlined in Figure 1, below.



It is important to clarify that this report does not seek to provide normative or prescriptive recommendations. It remains explicitly descriptive, capturing the status of connectivity in education in the nine countries surveyed, as it stood at the beginning of 2021, in an attempt to identify gaps as areas for future intervention. In addition, there is no intention of benchmarking or of developing a fully fledged comparative assessment of any of the policy areas addressed, as every situation is country-specific.

## 2 Regional overview

### 2.1 Overview of the education system and status of broadband

The first section of each country profile seeks to outline the specific national context in order to set the basis for the overview. Drawing upon extensive research by the country's main institutions dealing with education and telecommunications, the section presents statistical data for both policy areas, thereby providing an updated snapshot of the situation as of 2021.

In most of the nine countries covered, large-scale educational reforms can be traced back to the early 2000s, while in many others, smaller-scale reforms have been made over the past five years to update school curricula. Similarly, telecommunication policy reforms have occurred over the same period with the aim of fostering the spread of investment in connectivity. For each country, these sections will present the latest data available pertaining to education and telecommunications from various sources, including ITU and the United Nations Educational, Scientific and Cultural Organization (UNESCO).

The following subsections will paint a broader picture by pooling data from all nine countries and providing aggregate insights in order to identify general trends. By no means should this be understood as a comparison, as all countries have been making progress over time. Nevertheless, investigating the aggregate numbers will help in formulating certain conclusions and drawing distinctions in relation to other countries in the region.

#### Education systems data

As outlined in Table 1, around 23 million pupils between the ages of 6 and 17 and around 130 000 schools fall within the scope of this report. Notably, while fewer than seven years of compulsory education were often required only 20 years ago, all nine countries now require eight or more years, with the nine countries considered as a whole averaging more than 10 years of compulsory schooling.

**Table 1 - 2019 school data (multiple sources)**

	Length of compulsory education (years) <sup>i</sup>	Number of schools <sup>ii</sup>	Number of children and adolescents enrolled in primary and secondary school <sup>i</sup>	Number of children and adolescents out of school <sup>i</sup>	Number of children and adolescents not achieving minimum proficiency <sup>vi</sup>
Albania	9	3 808	423 176	31 277	171 809
Bosnia and Herzegovina	9	2 427	397 493	66 824 <sup>v</sup>	247 669
Georgia	9	2 309	599 471	9 355	311 725
Moldova	11	1 373	363 760	70 875	160 782
Montenegro	9	222 <sup>iii</sup>	95 981	5 918	48 566
North Macedonia <sup>*</sup>	13	626	265 633	11 528 <sup>iv</sup>	158 051
Serbia	8	2 083	792 952	45 473	294 978

Table 1 – 2019 school data (multiple sources) (continued)

	Length of compulsory education (years) <sup>i</sup>	Number of schools <sup>ii</sup>	Number of children and adolescents enrolled in primary and secondary school <sup>iii</sup>	Number of children and adolescents out of school <sup>iv</sup>	Number of children and adolescents not achieving minimum proficiency <sup>vi</sup>
Turkey*	12	86 398	16 384 160	1 521 931	6 078 523
Ukraine**	12	14 873**	4 211 509**	258 676	1 947 022
<b>Average</b>	<b>10.22</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>
<b>Total</b>	<b>N/A</b>	<b>129 246</b>	<b>23 491 838</b>	<b>2 021 857</b>	<b>9 498 684</b>

<sup>i</sup> Source: UNESCO (<http://data.uis.unesco.org>).

<sup>ii</sup> Source: EU European Education and Culture Executive Agency National Policies Platform (<https://national-policies.eacea.ec.europa.eu/>).

<sup>iii</sup> Source: UNICEF Montenegro Country Office (<https://skolskostatistika.edu.me/>).

<sup>iv</sup> This is an approximation based on Multiple Indicator Cluster Survey (MICS) data for 2018-2019 and the Makstat Database provided by the Ministry of Education and Science of North Macedonia. See [https://mics-surveys-prod.s3.amazonaws.com/MICS6/Europe\\_and\\_Central\\_Asia/North\\_Macedonia%2C\\_Republic\\_of/2018-2019/Survey\\_findings/North\\_Macedonia\\_and\\_North\\_Macedonia\\_Roma\\_Settlements\\_MICS\\_2018-19\\_SFR\\_English.pdf](https://mics-surveys-prod.s3.amazonaws.com/MICS6/Europe_and_Central_Asia/North_Macedonia%2C_Republic_of/2018-2019/Survey_findings/North_Macedonia_and_North_Macedonia_Roma_Settlements_MICS_2018-19_SFR_English.pdf) and <http://makstat.stat.gov.mk/PXWeb/pxweb/en/MakStat>.

<sup>v</sup> ITU calculation using World Bank data: based on 2013 enrolment rates of 88 per cent for primary education and 85 per cent for secondary education in the Federation of Bosnia and Herzegovina and 89 per cent for primary education and 79 per cent for secondary education in Republika Srpska, together with the number of students enrolled in each category for 2018. See <https://documents1.worldbank.org/curated/en/719981571233699712/pdf/Bosnia-and-Herzegovina-Review-of-Efficiency-of-Services-in-Pre-University-Education-Phase-I-Stocktaking.pdf>.

<sup>vi</sup> UNICEF figures for the number of students in primary, lower secondary and upper secondary not achieving minimum proficiency in mathematics, calculated using the latest data available from the UNESCO Institute of Statistics (UIS) and the Programme for International Student Assessment (PISA).

\* All data refer to 2019 apart from those for North Macedonia (2018) and Turkey (2018).

\*\* All data refer to 2020.

Importantly, according to UNESCO there are still almost 2 million children and adolescents of primary and secondary school age out of school in these countries, representing almost 9 per cent of the total school-age population. While the out-of-school population has substantially reduced over the years, those who remain excluded from education are disproportionately the region's most marginalized children and adolescents, including ethnic and linguistic minorities such as Roma and children with disabilities. Moreover, among those who are enrolled in education in these nine countries, close to 9.8 million children and adolescents are not achieving minimum proficiency in the foundational skills needed for further learning. Together, these challenges highlight the urgency of improving not only equitable access to education but also the quality of learning throughout the region.

## Connectivity data

With regard to Internet connectivity, Table 2 presents statistics on various indicators from the ITU World Telecommunication/ICT Indicators Database for 2019. With the aim of providing a picture of each country's connectivity status, these indicators include the percentage of Internet usage across the population, the estimated percentage of households with Internet access at home, the estimated percentage of households with a PC at home, the number of fixed- and mobile-broadband subscriptions per 100 inhabitants; and the percentage of the population covered by 4G/LTE.



Table 2 – 2020 data for selected indicators

	Internet usage (% of population)	Estimated % of households with Internet access at home	Estimated % of households with PC at home*	Fixed-broadband subscriptions/100 inhabitants	Mobile-broadband subscriptions/100 inhabitants	% of population with 4G/LTE coverage*
Albania	72.2	82.2 <sup>i</sup>	20.2 <sup>i</sup>	17.7	69.4	95.0
Bosnia and Herzegovina	73.2	72.0 <sup>i</sup>	64.8	23.5	47.3 <sup>i</sup>	82.0
Georgia	72.5	79.3 <sup>i</sup>	62.0	25.0	81.6	99.7
Moldova	76.1 <sup>iii</sup>	60.8 <sup>i</sup>	59.5	17.8	58.8	98.0
Montenegro	81.4	74.3 <sup>i</sup>	70.1 <sup>ii</sup>	29.3	85.9	97.7
North Macedonia	81.4	79.3 <sup>ii</sup>	67.3 <sup>ii</sup>	22.2	64.7	99.5
Serbia	78.4	80.1 <sup>i</sup>	73.1	25.1	94.3	96.9
Turkey	77.7	88.3	55.3	19.8	77.8	96.7
Ukraine	70.1 <sup>i</sup>	61.9 <sup>ii</sup>	62.3 <sup>i</sup>	18.6	85.9	78.1
<b>Total</b>	<b>113 785 259</b>	<b>34 246 260</b>	<b>26 903 152</b>	<b>30 223 696</b>	<b>120 093 883</b>	<b>138 049 318</b>
<b>Remaining gap</b>	<b>37 333 581</b>	<b>10 956 044</b>	<b>18 299 780</b>	<b>N/A</b>	<b>N/A</b>	<b>13 069 522</b>

Source: ITU World Telecommunication/ICT Indicators Database online (2020, available at <http://handle.itu.int/11.1002/pub/81550f97-en> (indicators i99H, xHH6\_IDI, xHH4\_IDI, i992b, i911mw, i271GA, i61 and i62).

\* Data for 2019 are used instead of for 2020.

<sup>i</sup> Data for 2019.

<sup>ii</sup> Data for 2018.

<sup>iii</sup> Data for 2017.

Notably, it remains the case that some 37 million individuals do not make use of the Internet, representing around 25 per cent of the total population of these countries and around 6 per cent of the population of the European region as a whole. However, as shown in Tables 3, 4 and 5, an additional 34.5 million people have been brought online over the past six years, which corresponds to a significant 43.5-per-cent increase and testifies to a positive transformation in these countries, albeit with some degree of variability in terms of impact.

Similarly, a close look at Table 2 above reveals that well over 11 million households do not have access to the Internet and more than 18 million are not in possession of a PC. This leaves approximately 36 million school-age children between 3 and 17 years old without Internet access at home in Eastern Europe and Central Asia.<sup>1</sup> While the 2015-2019 growth in household connectivity reached almost 30 per cent, the number of households with PCs at home grew by only 7.9 per cent over the same five-year period, bringing the 2019 figure to 57.5 per cent, with more than 18 million households still lacking a PC at home. The persistent lack of PCs in households is particularly significant at a time when lockdowns triggered by the pandemic facilitated the transition of economic activity to the digital sphere and meant that both educational and work activities were transferred to the home environment, thereby exacerbating existing inequalities in the areas of gender, residence and socio-economic status. However, this

<sup>1</sup> UNICEF and ITU, "How many children and young people have internet access at home? Estimating digital connectivity during the COVID-19 pandemic" (UNICEF, New York, 2020). Available at [www.itu.int/en/ITU-D/Statistics/Documents/publications/UNICEF/How-many-children-and-young-people-have-internet-access-at-home-2020\\_v2final.pdf](http://www.itu.int/en/ITU-D/Statistics/Documents/publications/UNICEF/How-many-children-and-young-people-have-internet-access-at-home-2020_v2final.pdf).

trend is offset by the adoption of mobile devices such as smartphones and tablets, which have lower fixed costs, require very limited digital skills, and allow for greater geographic mobility. It is important to note, however, that smartphones and tablets may require higher levels of digital skills when used for learning, and the efficacy of smartphones for delivering high-quality education and engaging in digital learning over long periods of time is disputed. Although no statistics are calculated by ITU at the national level, owing to the complex nature of the indicator and the impossibility of standardization for each country, the growth of mobile usage is indisputable and has a greater positive impact on economic activity, as will be shown below.<sup>2</sup>

As we turn to look at market data for the telecommunication sector, it is possible to identify a real “boom” in the number of mobile-broadband subscriptions per 100 inhabitants and a more modest, though still significant, number of new fixed-broadband subscriptions between 2015 and 2020. In 2020, more than 120 million active mobile-broadband subscriptions were reported across the nine countries, representing an increase of almost 110 per cent compared to 2015. With regard to fixed-broadband subscriptions, the growth figure stands at 65 per cent, though in absolute terms 11.9 million subscriptions have been activated since 2015—a number which cannot be ignored. Finally, with regard to mobile coverage, it is important to underscore that the proportion of the population covered by 4G/LTE technology has seen an increase of almost 800 per cent in only five years, with total coverage for 2019 standing at 91.4 per cent of the population, a figure that tends towards universal coverage and demonstrates the efficient work undertaken by operators, national regulatory authorities and governments. Particularly notable strides have been made in Bosnia and Herzegovina, Turkey and Ukraine, where there was no 4G coverage in 2015.

**Table 3 - 2015 data for selected indicators**

	Internet usage (% of population)	Estimated % of households with Internet access at home	Estimated % of households with PC at home	Fixed-broadband subscriptions/100 inhabitants	Mobile-broadband subscriptions/100 inhabitants	% of population with 4G/LTE coverage
Albania	63.3	25.0	20.2	8.4	44.9	35.0
Bosnia and Herzegovina	52.6	56.0	60.0	18.5	37.3	0.0
Georgia	47.6	45.1	49.7	15.8	54.0	82.0
Moldova	69.0	68.0	68.0	13.1	43.9	84.0
Montenegro	68.1	67.5	71.7	17.9	57.7	65.0
North Macedonia	70.4	69.4	68.4	17.5	54.3	71.0
Serbia	65.3	63.8	64.4	14.9	57.3	56.7
Turkey	53.7	69.5	55.6	12.1	49.7	0.0

<sup>2</sup> ITU, “The economic contribution of broadband, digitization and ICT regulation: Econometric modelling for the ITU Europe region” (Geneva, 2020). Available at [www.itu.int/dms\\_pub/itu-d/otp/pref/D-PREF-EF.BDT\\_EUR-2020-PDF-E.pdf](http://www.itu.int/dms_pub/itu-d/otp/pref/D-PREF-EF.BDT_EUR-2020-PDF-E.pdf).

Table 3 - 2015 data for selected indicators (continued)

	Internet usage (% of population)	Estimated % of households with Internet access at home	Estimated % of households with PC at home	Fixed-broad-band subscriptions/100 inhabitants	Mobile-broad-band subscriptions/100 inhabitants	% of population with 4G/LTE coverage
Ukraine	48.9	50.2	58.8	11.6	8.0	0.0
<b>Total</b>	<b>79 152 360</b>	<b>25 723 919</b>	<b>24 923 363</b>	<b>18 328 346</b>	<b>55 589 659</b>	<b>14 652 048</b>
<b>Remaining gap</b>	<b>68 134 567</b>	<b>17 669 580</b>	<b>18 470 136</b>	<b>N/A</b>	<b>N/A</b>	<b>132 634 878</b>

Source: ITU World Telecommunication/ICT Indicators Database online (2020), available at <http://handle.itu.int/11.1002/pub/81550f97-en> (indicators i99H, xHH6\_IDI, xHH4\_IDI, i992b, i911mw, i271GA, i61 and i62).

Table 4 - 2015/2020 percentage change for selected indicators

	Internet usage (% of population)	Estimated % of households with Internet access at home*	Estimated % of households with PC at home*	Fixed-broadband subscriptions/100 inhabitants	Mobile-broad-band subscriptions/100 inhabitants	% of population with 4G/LTE coverage*
Albania	14.2%	228.9%	0.0%	110.5%	54.7%	171.4%
Bosnia and Herzegovina	39.2%	28.6%	8.0%	26.9%	26.8%	N/A
Georgia	52.5%	75.6%	24.7%	58.4%	51.2%	21.6%
Moldova	10.3%	-10.7%	-12.5%	35.8%	34.0%	16.7%
Montenegro	19.5%	10.0%	-2.2%	63.6%	49.0%	50.2%
North Macedonia	15.7%	14.3%	-1.7%	26.7%	19.2%	40.1%
Serbia	20.0%	25.7%	13.5%	68.7%	64.7%	70.7%
Turkey	44.5%	27.0%	-0.5%	63.9%	56.4%	N/A
Ukraine	43.4%	23.2%	5.9%	59.9%	968.6%	N/A
<b>Total change</b>	<b>43.7%</b>	<b>33.1%</b>	<b>7.9%</b>	<b>64.9%</b>	<b>116.0%</b>	<b>728.8%</b>

Source: ITU World Telecommunication/ICT Indicators Database online (2020), available at <http://handle.itu.int/11.1002/pub/81550f97-en> (calculations based on indicators i99H, xHH6\_IDI, xHH4\_IDI, i992b, i911mw, i271GA, i61 and i62").  
\* Data for 2019 are used instead of for 2020.

Table 5 - 2015/2020 absolute change for selected indicators

	Internet usage	Estimated No. of households with Internet access at home*	Estimated No. of households with PC at home*	No. of fixed-broad-band subscriptions	No. of mobile-broad-band subscriptions	Population with 4G/LTE coverage*
Albania	252 773	450 948	926	266 619	703 465	1 725 192
Bosnia and Herzegovina	612 876	164 242	43 758	140 377	282 384	2 706 820
Georgia	984 623	324 219	113 373	364 041	1 008 860	502 630

Table 5 – 2015/2020 absolute change for selected indicators (continued)

	Internet usage	Estimated No. of households with Internet access at home*	Estimated No. of households with PC at home*	No. of fixed-broad-band subscriptions	No. of mobile-broad-band subscriptions	Population with 4G/LTE coverage*
Moldova	268 140	-94 477	-108 705	186 226	591 425	354 317
Montenegro	83 912	12 229	-2 941	71 759	178 029	1 287 122
North Macedonia	232 616	57 286	-6 479	98 074	219 553	1 132 841
Serbia	1 076 583	435 602	216 808	881 113	3 188 743	252 533
Turkey	22 593 801	3 820 470	294 463	7 049 802	25 854 479	80 684 781
Ukraine	8 527 577	2 916 479	1 428 586	2 837 279	32 397 306	32 789 192
<b>Total</b>	<b>34 632 900</b>	<b>8 522 968</b>	<b>1 979 789</b>	<b>11 895 351</b>	<b>64 504 224</b>	<b>121 435 427</b>

Source: ITU World Telecommunication/ICT Indicators Database online (2020), available at <http://handle.itu.int/11.1002/pub/81550f97-en> (calculations based on indicators i99H, xHH6\_IDI, xHH4\_IDI, i992b, i911mw, i271GA, i61 and i62").  
\* Data for 2019 are used instead of for 2020.

These achievements in the market have been facilitated by an efficient interplay between these actors and other main stakeholders to unlock the necessary investment in infrastructure. As investment requires strategic policies, accurate information about the market and good dialogue between authorities and operators, the role of broadband strategies, spectrum policies, broadband mapping and the related consultation processes is of the utmost importance. In accordance with these priorities, the ITU Office for Europe compiled a stocktaking report on broadband mapping systems in the region.<sup>3</sup> In the following subsections, a short account of the main programmes and tools (such as broadband mapping systems) is presented for each country.

## 2.2 Government strategies, status of education quality, and the role of ICTs

When it comes to the governance of education systems, it is important to note first and foremost that all nine countries consider education policy as a strategic priority. In fact, at different points in time over the past eight years, almost all countries have undertaken reforms in this area with the aim of innovating and modernizing education through strategic programmes covering, on average, the subsequent five to six years.

Still, multiple challenges persist in terms of education quality, including conflicting policy objectives, weak systems for ensuring high-quality teacher recruitment, training and retention, poor-quality teaching that does not adequately meet the diverse needs of learners, and insufficient alignment between curricula and the skills and competencies needed for employment. The Programme for International Student Assessment (PISA)<sup>4</sup> organized by the Organisation for Economic Co-operation and Development (OECD) gives useful insights into the quality of learning in these countries. Notably, while some have made significant improvements with

<sup>3</sup> [www.itu.int/go/UBQ2](http://www.itu.int/go/UBQ2).

<sup>4</sup> [www.oecd.org/pisa/](http://www.oecd.org/pisa/).

respect to past assessments, such longitudinal comparisons in PISA performance are not possible for others, which only participated in PISA for the first time in 2018.<sup>5</sup>

Nonetheless, two significant patterns emerge in factors that characterize underperformance in school at the national level: the urban-rural divide and the divide between high-income and low-income populations. This pattern is common to many other policy areas, such as telecommunications, and is found more consistently in these nine countries than in the OECD overall, although with particular nuances in each country. In addition, PISA assessments provide good insights into shortages in staff or school infrastructure, which often vary depending on the rural or urban setting of a school.

With regard to school governance, centralized information systems have been established in most countries in order to collect, manage and utilize education data more efficiently across the education system. These developments fall into a wider trend towards digitalization of public administration and public services; they have occurred at different points in time depending on the country, often related to the pace of digital transformation observable in the country, and have consequently led to heterogeneous outcomes.

Regarding the role of ICTs in the public administration of schools, it is worth mentioning that the failure to digitize information about school infrastructure, to display and store up-to-date demographic data, and to collect statistics on education participation and quality at the national level can hinder efficient, equity-based decision-making at both local and national government levels. In some cases, such failure can even limit the government's ability to effectively enumerate and gather relevant georeferenced data on the number of schools and children enrolled within a given territory.

On the other hand, some best practices are also observable in education management. Some countries are currently implementing and operating EMISs, which according to UNESCO are key to promoting "information within the ministry of education for policy planning, planning and implementation, decision making, monitoring and evaluation of the education system."<sup>6</sup> At the same time, this field presents significant opportunities to use sufficiently developed, digitally enabled EMISs and to leverage advancements in connectivity and digital innovation in education to drive equity-focused decision-making. For example, UNICEF is supporting countries in the region to integrate data analytics from learning management systems with existing education management information systems and to improve the accessibility, reliability, and relevance of education data. By bringing stakeholders together in this process and harnessing the potential of digital technology, UNICEF is supporting education systems to improve evidence-based decision-making and accountability, including for digital learning. As previously highlighted, developments in these fields are often dependent on the overall pace of digital transformation experienced within the country.

The presence or absence of digital innovation in the management of school systems is also directly related to the presence or absence of appropriate ICT infrastructure in schools. Table

<sup>5</sup> The PISA test, which is carried out every three years, has been shifted by one year as a result of the COVID-19 pandemic. The next PISA tests are therefore planned for 2022 and 2025.

<sup>6</sup> Tegegn Nuresu Wako, "Education Management Information Systems (EMIS): A Guide for Young Managers" (NESIS/UNESCO, Harare, 2003), p. 3 (available at <https://unesdoc.unesco.org/ark:/48223/pf0000220621>).

6 below summarizes available data on the number of computers per student (primary and secondary school) and percentage of PCs in schools connected to the Internet.<sup>7</sup>

It must be noted that, while PISA data on computers in schools is the most comprehensive and uniform dataset on the topic, the ratios are derived from the number of PCs per 15-year-old student in school. Although this report uses the ratios in Table 6 as a proxy for estimating the number of PCs available across all primary and secondary school institutions, the proxy is imperfect because technology is often dispersed differently among geographic areas and grade levels. More specifically, the estimates derived in this report may skew positively, given the typically greater PC-to-student ratios for 15-year-old students than, for example, 8-year-old students.

**Table 6 - Computers in schools and connected computers**

	Number of computers/ 15-year-old student in schools	% of PCs in schools connected to the Internet (min 2 Mbit/s)	Source	Date
Albania	0.23	66%	<a href="https://bit.ly/3ojMHdz">https://bit.ly/3ojMHdz</a> ; <a href="https://doi.org/10.1787/888934131253">https://doi.org/10.1787/888934131253</a>	2018
Bosnia and Herzegovina	0.30	74%	<a href="http://measurebih.com/uimages/MEASURE-BiH20BEA20Follow-on20Assessment20Final.pdf">http://measurebih.com/uimages/MEASURE-BiH20BEA20Follow-on20Assessment20Final.pdf</a> ; <a href="https://doi.org/10.1787/888934131253">https://doi.org/10.1787/888934131253</a>	2018
Georgia	0.44	96%	<a href="https://bit.ly/3ojMHdz">https://bit.ly/3ojMHdz</a> ; <a href="https://doi.org/10.1787/888934131253">https://doi.org/10.1787/888934131253</a>	2018
Moldova*	0.50	71%	<a href="https://bit.ly/3ojMHdz">https://bit.ly/3ojMHdz</a> ; <a href="https://doi.org/10.1787/888934131253">https://doi.org/10.1787/888934131253</a>	2018
Montenegro	0.21	N/A	<a href="https://doi.org/10.1787/888934131253">https://doi.org/10.1787/888934131253</a>	2018
North Macedonia	0.43	N/A	<a href="https://doi.org/10.1787/888934131253">https://doi.org/10.1787/888934131253</a>	2018
Serbia	0.30	N/A	<a href="https://doi.org/10.1787/888934131253">https://doi.org/10.1787/888934131253</a>	2018
Turkey	0.25	89%	<a href="https://bit.ly/3ojMHdz">https://bit.ly/3ojMHdz</a> ; <a href="https://doi.org/10.1787/888934131253">https://doi.org/10.1787/888934131253</a>	2018
Ukraine	0.72	N/A	<a href="https://doi.org/10.1787/888934131253">https://doi.org/10.1787/888934131253</a>	2018
<b>OECD average</b>	0.83	96.4%	<a href="https://bit.ly/3ojMHdz">https://bit.ly/3ojMHdz</a>	2018

\* A 2019 Order from the Ministry of Education, Culture and Research established minimum standards for ICT equipment for all public schools ([https://mecc.gov.md/sites/default/files/standarde\\_dotarecabinetescolarefinalordin.pdf](https://mecc.gov.md/sites/default/files/standarde_dotarecabinetescolarefinalordin.pdf), p. 30). However, no minimum requirement on Internet connection was set.

Although the data points for the number of PCs connected to the Internet come from different sources, the idea is to provide a sense of the existing divergence from the OECD average. More accurate information at the country level is certainly needed, but there is enough to highlight the existing divide in terms of both the number of available devices per student and the percentage of computers connected to the Internet.

<sup>7</sup> Data for numbers of computers per student at school taken from the PISA 2018 Database Table V.B1.5.6, published in May 2020 and available at <https://doi.org/10.1787/888934131253>.

Such an infrastructure gap inherently translates into the digital skills gaps observable in these countries.<sup>8</sup> While it is not the intention of this report to assess digital skills development in education systems, the relationship between digital infrastructure in schools and digital skills development—for both learners and teachers—is self-evident. While it is appreciable that almost all countries within the scope of this study have to some degree incorporated digital skills development into official national curricula, the determinant limiting factor largely remains infrastructure. ICT laboratories and computers dedicated to education are, in fact, essential to implementing efficient digital skills development programmes that extend nationwide and have the intended effect.

ICT infrastructure is established not only as the main pillar of the efficient management of the education system but also as an enabler for the introduction of digital skills development at the curricular level. Taking into consideration the data from Table 6 above, in combination with the UNESCO data in Table 1, it is possible to estimate the number of PCs needed in schools to reach the OECD average: more than 11.5 million devices, approximately, as shown in Table 7. While Table 7 reflects very rough, preliminary calculations, the figures provide some insight into the financial and logistical magnitude of the gap. In addition, close to 7.8 million school-age children are without Internet access, according to data from UNICEF.

To estimate the cost of reaching the OECD average of 0.83 PCs per student in school, both low-range and high-range estimates were calculated. First, to obtain a low-range estimate, the total gap of 11.5 million devices was multiplied by USD 73.60, the unit price of the cheapest available Internet-enabled devices in the region. The smartphone price of USD 73.60 was calculated as the average USD cost in 2020 of the cheapest available device for accessing the Internet in three countries within the scope of this report: Georgia, Turkey and Ukraine.<sup>9</sup> It is important to note that the efficacy of smartphones for delivering high-quality education and engaging in digital learning over long periods of time is disputed, and, although smartphones are used as a proxy for the cheapest way to access online educational content and represent a baseline cost, they are not comparable to PCs for educational purposes. Nevertheless, given the price estimate of USD 73.60 per device, and a gap of 14.1 million devices, filling the device gap in education in these nine countries would cost no less than USD 1 billion. A higher-range cost estimate was calculated using a price of USD 850 per device, representing the cost in 2020 of a higher-end computer and monitor according to UNICEF estimates. To reach the OECD average of 0.83 PCs per student in school using exclusively higher-end devices would therefore cost USD 12 billion. As a mixture of device types and qualities would realistically be purchased in order to fill the device gap, the total cost would fall in the range between USD 1 billion and USD 12 billion.

Moreover, existing devices becoming obsolete with time is also a factor that must be taken into account and which raises the overall figure, while recurrent costs related to the maintenance of devices and the upskilling of teachers and school personnel to use them effectively for educational purposes must not be overlooked.

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<sup>8</sup> ITU Digital Skills Assessment for Europe (forthcoming).

<sup>9</sup> Alliance for Affordable Internet (A4AI) 2020 device pricing data.

**Table 7 - Estimated number of PCs needed to reach the OECD average**

	No. of children and adolescents enrolled in primary and secondary schools	Estimated No. of PCs in schools	Estimated No. of PCs needed in schools to reach OECD average
Albania	423 176	98 302	254 085
Bosnia and Herzegovina	422 645	125 605	226 340
Georgia	599 471	266 320	232 872
Moldova	363 760	181 467	121 444
Montenegro	95 981	20 221	59 704
North Macedonia	265 633	113 040	108 158
Serbia	792 952	241 530	418 778
Turkey	16 384 160	4 023 800	9 619 633
Ukraine*	4 264 156	364 652	3 107 138
<b>Total</b>	<b>23 422 046</b>	<b>5 434 938</b>	<b>14 148 153</b>

<sup>i</sup> Source: UNESCO (<http://data.uis.unesco.org>) and PISA data from Table 6 above.

\* data for Ukraine provided by Ukrstat: [http://www.ukrstat.gov.ua/operativ/operativ2021/osv/osv\\_rik/zcpho\\_Ukr\\_2020.xls](http://www.ukrstat.gov.ua/operativ/operativ2021/osv/osv_rik/zcpho_Ukr_2020.xls)

The crux of this report lies in its discussion of how investment in ICT infrastructure development in schools can be fostered to ensure that schools are equipped with the infrastructure necessary to operate efficiently for all learners, including when face-to-face learning is disrupted, and be enabled to implement high-quality, inclusive, flexible and personalized learning and skills development, including digital skills development through the provision of digital public goods, in line with each country's education policy and programme.

The main assumptions are: first, that the education sector aims to improve participation in and the quality of learning, including through competency-based curricula and digital skills development that are aligned with the demands of the labour market and that shape the skilled workforce needed to facilitate digital transformation within countries and the region; and second, that digital technology is being harnessed to accelerate progress toward these aims and to build stronger, more resilient education systems. If these are true, ICT infrastructure in schools, mainly through devices and appropriate and reliable Internet connectivity, is necessary to achieve these aims. In addition, including ICT infrastructure in strategic approaches to fostering connectivity in the education system is a critical component of a broader enabling environment to create digital skills, which in turn creates a positive feedback loop for further demand for connectivity. As a potential outcome, a multistrategic approach can catalyse the much-needed conditions for the digitalization of education management and policy planning and assessment, thereby spurring a virtuous circle of mutual reinforcement that is able to sustainably propel digital development and enrich the education sector at the national level.



## 2.3 Multistakeholder partnerships and financing mechanisms fostering investment in school connectivity

Some countries have recently established minimum requirements for equipment in public schools that include the distribution of PCs and the allocation of public funds to the provision of minimum equipment. This represents a fraction of the funding needed to achieve levels of computers per student similar to those in the OECD.

In addition to the problem of equipment, connectivity is also a great challenge from both a financial and, more importantly, technical and logistical perspective, with schools often located in remote geographical areas where adequate provision of service is not available or even commercially viable for operators.

Ministries of education and research, which oversee resources and define procurement policies for education systems, often sacrifice investment in ICT equipment in favour of other fundamental school infrastructure, such as electricity, sanitation and hygiene facilities, educational or other spaces and classroom equipment (e.g. desks, chairs and chalk boards). At the same time, ministries of education may not have a strong voice in decision-making related to the provision of Internet connectivity, and ministries in charge of the ICT development portfolio tend to prioritize the financing of ICT infrastructure, with the ultimate goal of reaching all households and covering the largest possible share of the population with the highest quality of services. Only recently have these policies started to include requirements for public services, on both sides of procurement and connectivity, to align public administrations with the digital transformation process at the country level. However, schools have often been neglected, especially in rural and remote areas, which increases the risk of schools—and especially the most marginalized and vulnerable children and young people—being excluded by government programmes in the quest for better ICT infrastructure.

That said, international financial mechanisms for wider broadband infrastructure investment do exist. For example, in the context of the Western Balkans, the Western Balkans Investment Framework is a strong mechanism through which the European Investment Bank, the European Bank for Reconstruction and Development and the World Bank contribute financially and provide project assistance and implementation to countries. In recent years, however, ministries in charge of the education portfolio, as well as other relevant ministries that oversee the digitalization of other public services, have not fully capitalized on these opportunities.

The international development community has identified this gap and started supporting governments in remedying it, with ITU and UNICEF at the forefront after launching the Giga project in 2019. While sharing many topics with Giga, this report is not intended to enter into the details of the project, which is focused on other regions of the world, but rather seeks to provide a grassroots picture of the situation in selected countries of the European region, potentially providing a basis for future action. Moreover, it must be noted that these more specific initiatives focusing on meaningfully connecting schools and communities are supported at the highest level of the United Nations system, thanks to the United Nations Secretary-General's Roadmap for Digital Cooperation,<sup>10</sup> launched in 2018, the goal of which is to bridge the digital divide and leverage the potential of ICTs to achieve the SDGs.

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<sup>10</sup> [www.un.org/en/content/digital-cooperation-roadmap/](http://www.un.org/en/content/digital-cooperation-roadmap/).

Amid the global impulse on digital divide issues, which has education as one of its pillars—one that is both significantly impacted by and critical to bridging the digital divide—all countries have come to recognize the importance of ICT infrastructure in schools, not only to put public institutions on the path towards digital transformation, but also to lay the groundwork for the successful implementation of digital skills programmes that will equip students with the knowledge necessary to succeed in their lives, as outlined in the previous section.

In this context, international organizations and international financial institutions have been active in closing the gap by facilitating partnerships with governments and private sector partners and providing technical assistance or funding for projects. Increasingly, these have focused more generally on decreasing the costs of or improving access to household connectivity, or on the procurement of devices and connectivity contracts in public administration institutions, rather than on school connectivity in particular.

Nevertheless, while these activities have raised awareness at national level of the importance of ICTs and connectivity for achieving the SDGs, more can be done in relation to connectivity in education.

## **2.4 National responses to COVID-19 and educational initiatives for distance learning**

In March 2020, all nine countries within the scope of this study faced nationwide closures of school buildings as a result of the COVID-19 outbreak, affecting 23 million primary and secondary school students and their households, with parents also switching to remote working when possible.

What at first seemed a temporary closure necessitated the transition to emergency remote instruction and, eventually, more carefully planned distance learning as the primary mode of education delivery for periods of up to three months and, in many cases, resulted in the academic year ending remotely and the delayed or staggered reopening of schools at the start of the subsequent 2020-2021 academic year. All nine countries covered by this report responded swiftly to this emergency, of which education was only one component, but the responses that emerged were different as each situation was country-specific in terms of technical, political, societal and organizational variables.

For millions of children, however, transferring education from the classroom to the home environment was made possible through the use of ICTs. The most widespread alternative delivery modality implemented across countries was the use of television broadcasting to transmit lessons and other educational material. Television is a low-technology solution, enabling a broad reach, especially for disadvantaged children and young people and regardless of geographic location, digital skills possessed or technological capability for Internet access. However, such learning is ideally supported by parents or caregivers, particularly for younger children, and is limited in terms of the interaction that it enables among teachers and learners.

The second most common solution implemented has been the creation or strengthening of national online distance learning platforms, often in partnership with local actors or international organizations, to deliver digital content through the Internet. The rates of participation in these platforms vary substantially depending on the country, with constraints arising from the lack of access to connectivity, lack of appropriate devices, and overall limited financial resources necessary to ensure children's online engagement. Moreover, rates of participation also vary

substantially within countries owing to the digital divide, which disproportionately excludes children in remote, rural areas, children from the poorest families, Roma and other ethnic and linguistic minorities, children with disabilities, and girls.

A rarer solution, which substantially relies on ICTs, has been the organization of synchronous, online lessons in the virtual environment. While this modality facilitates active engagement and enables greater teacher-student interaction in real time, it is also logistically more difficult to organize. It presupposes and requires that all children who must participate in a lesson have access to and the ability to use an appropriate device connected to the Internet for at least as long as the duration of the lesson. According to a recent joint UNICEF-ITU publication,<sup>11</sup> the proportion of children and young people age 25 and under having Internet access at home in Eastern Europe and Central Asia stands at 59 per cent, with rural areas averaging 45 per cent against 66 per cent for urban areas and the figure for low-income households being as little as 40 per cent, versus high-income households at 89 per cent.<sup>12</sup> While not a direct measure of the situation in each of the nine countries studied in this report, these figures provide a better sense of the existing connectivity gaps and some insight into how the pandemic has exacerbated existing divides, as life became confined to the home environment and access determined by connectivity.

Across these countries, another major effort has been coordination at the level of the education system and with teachers, who have been the final implementers and coordinators of their classes' distance learning activities during lockdowns. This has also been a substantial challenge, requiring rapid and clear elaboration of guidelines by the competent ministries and swift upskilling of teachers to ensure a coordinated rollout of distance learning. Despite these efforts, most countries have reported that a portion of students were unable to access education content and benefit from continuity of education delivery, mainly for economic and other reasons. Notable equity gaps have been highlighted in the reach of and participation in these modalities, particularly among children and young people who were already the most marginalized and whose learning outcomes were already lower than their more advantaged peers. Moreover, significant gaps in information on the quality of learning remain, presenting challenges for accurately assessing the efficacy of the modalities employed. In many cases, the private sector, non-governmental organizations (NGOs) and international organizations such as UNICEF have chipped in to fill gaps, such as by procuring devices for the most marginalized children or delivering paper-based learning materials. Still, there is a looming risk of large learning gaps, especially for those who were already behind, and increasing school dropout rates, particularly for the most vulnerable children, including Roma, girls, and children with disabilities. Consequently, the progress facilitated by the substantial reforms implemented over the past 20 years to improve education access and quality risks being reversed, especially by growing inequalities.

Throughout the course of the COVID-19 pandemic, some countries have reopened schools, and many have employed a variety of methods and hybrid solutions to facilitate a return to face-to-face learning. Some have recommenced classroom learning in certain geographical areas, according to the epidemiological situation. Others have organized classes in shifts, and some have prioritized vulnerable populations or specific grade levels to steer education services

<sup>11</sup> UNICEF and ITU, "How many children and young people have Internet access at home? ... " (see footnote 1 above).

<sup>12</sup> "Low income" is defined as the lowest quintile of the distribution, while "high income" is defined as the highest quintile.

towards a new normal. As the objective of most governments remains to bring students back to the classroom, it is important to refocus on school connectivity as an enabling factor for high-quality, inclusive education. Making connectivity available in schools and increasing its uptake would ensure that technology-enabled and hybrid solutions can be part of high-quality, inclusive learning delivery. This would not only strengthen education systems' relevance for the 21st century by enabling digitally-supported learning and skills development, but also resilience to future crises by enabling distance learning and smooth transitions between distance and face-to-face instruction. It would also support more inclusive access to education for children on the move and out-of-school children, as well as the broader digital transformation of the education sector, including access to high-quality digital skills development, participation in an increasingly connected society, and smarter, equity-focused administration of the education system.

## 3 Country profiles

### 3.1 Albania

#### 3.1.1 Overview of the education system and status of broadband

Education in Albania is considered a public good and service. Over the past few decades, the country has made significant reforms towards the decentralization of school governance. These changes have brought about a competency-based curriculum across the country's public education system, contributing to significant improvements in key education indicators.<sup>13</sup> In combination with other socio-economic reforms, the mobilization of financial resources by the Albanian Government has improved instruction quality, textbooks, school buildings and infrastructure throughout the country.<sup>14</sup> Moreover, starting from 2003, regional education directorates and education offices emerged under the auspices of the Ministry of Education, Sports and Youth to support the implementation of national education policies in schools. In terms of organization, the Albanian pre-tertiary education system includes pre-school education, basic education (comprising primary and lower secondary education) and upper secondary education (often referred to in Albania as simply "secondary education").<sup>15</sup> Compulsory education lasts nine years, from age 6 to age 16.<sup>16</sup>

There are some 3 818 schools across urban and rural areas in Albania, including kindergartens, basic and lower secondary, upper secondary, vocational schools and institutions providing special needs education.<sup>17</sup> From pre-primary to upper-secondary education, 507 959 students are enrolled in these schools.<sup>18</sup> Albania's Institute of Statistics reports that 34 982 students graduated from basic education in 2019,<sup>19</sup> and the completion rate of upper secondary education for young people of school age was 77.9 per cent.<sup>20</sup> Still, however, UNESCO reported that in 2019 there were about 31 227 children, adolescents and young people out of school in Albania.<sup>21</sup> While UNESCO data show that the literacy rate for the 15-24 age group is 99.3 per cent,<sup>22</sup> approximately 40.6 per cent of children and young people do not achieve minimum proficiency in the foundational skills needed for further learning and skills development.<sup>23</sup>

<sup>13</sup> [www.oecd-ilibrary.org/docserver/7f73878b-en.pdf?expires=1605526453&id=id&accname=guest&checksum=5A228BDE5E7519BDA456F270466ADE52](http://www.oecd-ilibrary.org/docserver/7f73878b-en.pdf?expires=1605526453&id=id&accname=guest&checksum=5A228BDE5E7519BDA456F270466ADE52).

<sup>14</sup> <https://education.stateuniversity.com/pages/12/Albania-EDUCATIONAL-SYSTEM-OVERVIEW.html>.

<sup>15</sup> [www.oecd-ilibrary.org/docserver/7f73878b-en.pdf?expires=1605526453&id=id&accname=guest&checksum=5A228BDE5E7519BDA456F270466ADE52](http://www.oecd-ilibrary.org/docserver/7f73878b-en.pdf?expires=1605526453&id=id&accname=guest&checksum=5A228BDE5E7519BDA456F270466ADE52).

<sup>16</sup> <http://uis.unesco.org/en/country/al>.

<sup>17</sup> [https://eacea.ec.europa.eu/national-policies/eurydice/albania/statistics-educational-institutions\\_en](https://eacea.ec.europa.eu/national-policies/eurydice/albania/statistics-educational-institutions_en).

<sup>18</sup> <http://data.uis.unesco.org/#> (Indicators: enrolment in pre-primary education, both sexes; enrolment in primary education, both sexes; enrolment in secondary education, both sexes.)

<sup>19</sup> [www.instat.gov.al/media/6958/graduation-statistics.pdf](http://www.instat.gov.al/media/6958/graduation-statistics.pdf).

<sup>20</sup> [https://data.unicef.org/resources/data\\_explorer/unicef\\_f/?ag=UNICEF&df=GLOBAL\\_DATAFLOW&ver=1.0&dq=ALB.ED\\_ANAR\\_L02+ED\\_15-24\\_LR+ED\\_ROFST\\_L3+ED\\_ROFST\\_L1+ED\\_CR\\_L3+ED\\_ANAR\\_L3+ED\\_CR\\_L2+ED\\_ROFST\\_L2\\_T.&startPeriod=2016&endPeriod=2020](https://data.unicef.org/resources/data_explorer/unicef_f/?ag=UNICEF&df=GLOBAL_DATAFLOW&ver=1.0&dq=ALB.ED_ANAR_L02+ED_15-24_LR+ED_ROFST_L3+ED_ROFST_L1+ED_CR_L3+ED_ANAR_L3+ED_CR_L2+ED_ROFST_L2_T.&startPeriod=2016&endPeriod=2020).

<sup>21</sup> <http://data.uis.unesco.org/#> (Indicators: out-of-school children, adolescents and youth of primary and secondary school age, both sexes.)

<sup>22</sup> <http://uis.unesco.org/country/al>.

<sup>23</sup> UNICEF calculation for the number of students in primary, lower secondary and upper secondary not achieving minimum proficiency in mathematics; data for Albania are calculated using the latest figures available from UIS and PISA.

With regard to broadband development, ITU data indicate that 72.2 per cent of individuals in Albania used the Internet in 2020.<sup>24</sup> In the same year, the proportion of individuals aged 16 to 74 who had used the Internet in the previous three months stood at 72.2 per cent, according to the Albanian National Institute of Statistics (INSTAT).<sup>25</sup> The number of fixed-broadband subscriptions per 100 inhabitants was 17.7 in 2020, according to ITU data.<sup>26</sup> Between 2013 and 2020, fixed-broadband penetration across the population as a whole and per household increased more than twofold, growing by 10 to 15 per cent annually, although it remains well below both the EU average and the penetration levels of neighbouring countries.<sup>27</sup> Despite this significant increase, ITU data show that the proportion of households with Internet access at home was 32.9 per cent in 2019.<sup>28</sup> According to INSTAT, however, the proportion of households with Internet access stood at 83.3 per cent in 2020.<sup>29</sup> In 2020, the number of active mobile-cellular subscriptions per 100 inhabitants was 91.<sup>30</sup> Moreover, the number of active mobile-broadband subscriptions per 100 inhabitants was 69.4 in the same year.<sup>31</sup> In total, 63 per cent of Albanians use mobile broadband.<sup>32</sup> Data from the country's Electronic and Postal Communications Authority (AKEP) reflect similar mobile-broadband usage rates, with 2.4 million users having used the network at least once during 2019 and about 1.7 million active users having used mobile Internet in the previous three months.<sup>33</sup>

According to the Digital Agenda for 2015-2020, the physical extent of Albania's fibre-optic infrastructure reached 5 000 km in 2015, and the network has been growing ever since.<sup>34</sup> Broadband is currently supplied through various fixed and mobile technologies, including DSL, FTTH/FTTB, and FTTx in combination with next-generation access. Most DSL lines are combined with fibre-optic and copper networks (FTTN/FTTB). Broadband is also supplied via coaxial cable (HFC) and electricity lines (BPL). Increased investments in optical fibre (FTTH and FTTB) are being made by fixed-network operators. Yet broadband speeds, according to reports and feasibility study results from AKEP, are low: the existing bandwidth in the fixed and mobile networks is less than 30 Mbit/s.<sup>35</sup>

In terms of mobile technologies, broadband is supplied via 3G/HSPA/HSPA+ and 4G/LTE networks, as well as satellite technologies. In 2020, 99.9 per cent of the population had 3G

<sup>24</sup> ITU World Telecommunication/ICT Indicators Database online (2021), available at <http://handle.itu.int/11.1002/pub/81550f97-en> (indicator i99H).

<sup>25</sup> [www.instat.gov.al/media/8266/ict-2020-english\\_.pdf](http://www.instat.gov.al/media/8266/ict-2020-english_.pdf); information provided by the Albanian Ministry of Infrastructure and Energy.

<sup>26</sup> ITU World Telecommunication/ICT Indicators Database online (2021), available at <http://handle.itu.int/11.1002/pub/81550f97-en> (indicator i992b).

<sup>27</sup> [www.infrastruktura.gov.al/wp-content/uploads/2020/07/National-Plan-BBAnd-EN.pdf](http://www.infrastruktura.gov.al/wp-content/uploads/2020/07/National-Plan-BBAnd-EN.pdf).

<sup>28</sup> [www.itu.int/en/ITU-D/Statistics/Documents/statistics/2019/CoreHouseholdIndicators.xlsx](http://www.itu.int/en/ITU-D/Statistics/Documents/statistics/2019/CoreHouseholdIndicators.xlsx).

<sup>29</sup> [www.instat.gov.al/media/8266/ict-2020-english\\_.pdf](http://www.instat.gov.al/media/8266/ict-2020-english_.pdf); information provided by the Albanian Ministry of Infrastructure and Energy.

<sup>30</sup> ITU World Telecommunication/ICT Indicators Database online (2021), available at <http://handle.itu.int/11.1002/pub/81550f97-en> (indicators i911).

<sup>31</sup> ITU World Telecommunication/ICT Indicators Database online (2021), available at <http://handle.itu.int/11.1002/pub/81550f97-en> (indicators i911mw).

<sup>32</sup> [www.akep.al/wp-content/uploads/2020/07/RAPORT-VJETOR-AKEP-2019-PER-KUVEND.pdf](http://www.akep.al/wp-content/uploads/2020/07/RAPORT-VJETOR-AKEP-2019-PER-KUVEND.pdf).

<sup>33</sup> [www.akep.al/wp-content/uploads/2020/07/RAPORT-VJETOR-AKEP-2019-PER-KUVEND.pdf](http://www.akep.al/wp-content/uploads/2020/07/RAPORT-VJETOR-AKEP-2019-PER-KUVEND.pdf).

<sup>34</sup> Albania Digital Agenda 2015-2020, available at [https://issuu.com/miap4/docs/booklet\\_m-inovacionit\\_preview](https://issuu.com/miap4/docs/booklet_m-inovacionit_preview).

<sup>35</sup> [www.infrastruktura.gov.al/wp-content/uploads/2020/07/National-Plan-BBAnd-EN.pdf](http://www.infrastruktura.gov.al/wp-content/uploads/2020/07/National-Plan-BBAnd-EN.pdf).

network coverage, while 4G covered about 95 per cent of the population in 2019.<sup>36</sup> During the same year, mobile-broadband Internet traffic within the country was 0.069 EB.<sup>37</sup>

AKEP benefits from a broadband infrastructure mapping system, ATLAS,<sup>38</sup> established in 2012. The system includes a registry of all fixed and mobile telecommunication infrastructure in GIS format, providing transparent information on the availability of broadband to the market and consumers. The system, which comprises 220 infrastructure and three mobile operators, also supports infrastructure sharing and the efficient allocation of public funding.<sup>39</sup>

### 3.1.2 Government strategies, status of education quality, and the role of ICTs

In January 2016, Albania adopted the Pre-University Education Development Strategy 2014-2020, delineating a vision for the future and an implementation plan complete with specific activities, responsibilities and deadlines.<sup>40</sup> The four priorities for education include: (i) improving the governance, leadership and management capacities of pre-university education system resources; (ii) high-quality and inclusive learning; (iii) quality assurance based on comparable standards with EU countries; and (iv) modern teacher training and development.<sup>41</sup>

As the development of and consultations for the forthcoming pre-university education development strategy for 2021-2026 are under way, it is worth mentioning the priorities upon which it is predicated. The process of developing the National Education Strategy 2021-2026 was undertaken by the Ministry of Education, Sports and Youth, with technical assistance from UNICEF and the active participation of specialists, field experts and other stakeholders. The strategy was developed in line with the Ministry's vision of a high-quality education system based on the principles of inclusion and lifelong learning, which enables the development of the individual's potential, contributing to personal well-being, as well as to the strengthening of democracy and the country's integration into the European Union. This approach also respects diversity and inclusion and seeks to narrow the gaps in educational attainment among different groups of learners in Albania. The Strategy is based on the principles of equality and lifelong learning, including both formal and informal learning, and is guided by three policy goals: first, to provide high-quality and inclusive pre-university education that enables students to develop the knowledge, skills, attitudes and values to thrive in a democratic society and contribute to personal and societal well-being; second, to support effective and efficient management of the education system at all levels, based on functional mechanisms for quality assurance, transparency and accountability; and third, to provide inclusive higher education that meets international quality standards and promotes the country's economic and social development.

<sup>36</sup> ITU World Telecommunication/ICT Indicators Database online (2020), available at <http://handle.itu.int/11.1002/pub/81550f97-en> (indicators i271G and i271GA).

<sup>37</sup> ITU World Telecommunication/ICT Indicators Database online (2020), available at <http://handle.itu.int/11.1002/pub/81550f97-en> (indicator i136mwi).

<sup>38</sup> [www.itu.int/en/ITU-D/Regional-Presence/Europe/Documents/Events/2020/RRF/Session%204\\_Fjoralid%20Bitri\\_AKEP%20Mapping%20of%20Broadband%20Infrastructure%20in%20Albania-%20Fjoralid%20Bitri%20%281%29.pdf](http://www.itu.int/en/ITU-D/Regional-Presence/Europe/Documents/Events/2020/RRF/Session%204_Fjoralid%20Bitri_AKEP%20Mapping%20of%20Broadband%20Infrastructure%20in%20Albania-%20Fjoralid%20Bitri%20%281%29.pdf)

<sup>39</sup> [www.itu.int/en/ITU-D/Regional-Presence/Europe/Documents/Events/2020/RRF/20-11-26%20Background%20Paper\\_Broadband%20Mapping%20Systems%20in%20Europe%20and%20Regional%20Harmonization%20Initiatives\\_final.pdf](http://www.itu.int/en/ITU-D/Regional-Presence/Europe/Documents/Events/2020/RRF/20-11-26%20Background%20Paper_Broadband%20Mapping%20Systems%20in%20Europe%20and%20Regional%20Harmonization%20Initiatives_final.pdf)

<sup>40</sup> <https://arsimi.gov.al/wp-content/uploads/2018/03/STRATEGJIA-2014-2020.pdf>

<sup>41</sup> Ministry of Education, Sports and Youth, "Strategjisë së Zhvillimit të Arsimit Parauniversitar, për Periudhën 2014-2020" (Pre-University Education Development Strategy 2014-2020), available at <https://qbz.gov.al/>.

The first goal is intended to:

- Ensure inclusion and participation in the preparatory class and compulsory education, as well as increase access to pre-school and upper secondary education, and ensure the social, emotional and physical well-being of all students in order to reduce dropout rates and enable students to reach their full potential;
- Create opportunities for high-quality teacher training through improvements to a career system that encourages teachers to develop higher-level teaching skills;
- Ensure implementation of the competency-based curriculum through effective teaching and use of high-quality resources;
- Develop digital competency by utilizing ICTs better in teaching and learning.

The second policy goal has the following objectives:

- Enhance school performance through professional and accountable leadership and through management and quality assurance;
- Ensure the best performance of the education system by designing an inclusive evaluation framework and capacity for its implementation.

The third policy goal aims to:

- Enhance the quality of higher education through the reorganization of study programmes, the modernization of academic infrastructure and the implementation of high standards of institutional evaluation;
- Encourage the highest standards in teaching and scientific research;
- Connect higher education to the labour market;
- Ensure academic integrity, transparency, and accountability in the higher education sector;
- Improve students' social and economic status by providing high-quality services and various types of financial aid;
- Internationalize higher education in Albania, including integration into the European Higher Education Area;
- Advance ICT infrastructure and digital services for public higher education institutions.

Although the strategy for 2021-2026 has not yet been approved, the explicit objective of enhancing digital competencies by leveraging ICTs indicates the willingness of the Ministry of Education, Sports and Youth to prioritize ICTs with a view to achieving the three pillars outlined in the introduction to this report.

OECD PISA results<sup>42</sup> indicate that, between 2015 and 2018, Albania saw improvements, on average, in its students' performance in reading, mathematics and science throughout their participation in PISA.<sup>43</sup>

In terms of school governance, Albania has started to establish some of the components integral to system evaluation. The country's Educational Services Centre is developing a modern EMIS, which is set to store information related to students, teachers, curricula and schools in pre-tertiary

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<sup>42</sup> PISA tests the reading, mathematics and science performance of 15-year-old pupils across the world every three years. In the context of the EU, PISA results are particularly important because they feed into the Education and Training 2020 strategic cooperation framework (ET2020). They form the basis for one of the ET2020 benchmarks: the rate of underachievers in reading, mathematics or science among 15-year-olds in the EU should be less than 15 per cent by 2020. Underachievers in PISA are those pupils who fail to reach the minimum proficiency level necessary to participate successfully in society. More information on the PISA indicators and ET2020 is available at [https://ec.europa.eu/education/sites/education/files/document-library-docs/pisa-2018-eu\\_1.pdf](https://ec.europa.eu/education/sites/education/files/document-library-docs/pisa-2018-eu_1.pdf).

<sup>43</sup> [www.oecd.org/pisa/Combined\\_Executive\\_Summaries\\_PISA\\_2018.pdf](http://www.oecd.org/pisa/Combined_Executive_Summaries_PISA_2018.pdf).



education. As a data tool, Socrates has emerged as an excellent opportunity for Albania to modernize the collection, management and use of education data across its education system. In the face of continuing challenges with respect to Socrates, and within the framework for data collection, the OECD and UNICEF recommend that the Albanian Government should: (i) address gaps in the development of Socrates and establish it as the central source of education data; (ii) develop Socrates into a functional tool to inform decision-making; and (iii) establish a national indicator framework to guide the development of Socrates.<sup>44</sup>

To further decentralize core functions and improve service delivery, Albania has recently restructured the key agencies responsible for school support.<sup>45</sup> As a result of the reform and other current government initiatives, Albania maintains wide access to primary and basic education, with a net enrolment rate of 96 per cent. However, disparities in opportunity and outcomes persist across population groups, as there are still a significant number of children of Roma ethnicity or children with disabilities who do not enjoy the same right to education. Albania also has one of the highest dropout rates in the Western Balkans, and many graduates leave school without mastering basic educational competencies.<sup>46</sup>

In rural areas, there are about 17 students per class in basic public education, as compared to around 21 students per class on average across all Albanian basic education public schools.<sup>47</sup> Similar to other countries in the region, educational outcomes in Albania tend to be lower in rural areas. Studies have shown that the average educational attainment in rural regions is about two years of schooling lower than in urban regions.<sup>48</sup>

Additionally, data from PISA indicate that a significantly greater number of extracurricular activities are offered in urban schools than in rural schools, thereby contributing to disparate educational outcomes. Furthermore, data indicate that only half of school computers across the country are connected to the Internet. Other challenges that remain barriers to an equitable educational system include poor infrastructure around schools (e.g. roads, transport systems and heating systems)<sup>49</sup> and the difficulty of recruiting high-quality teachers to rural areas, which has largely contributed to regional differences in student access to education and job opportunities, as well as in overall learning experiences among students.<sup>50</sup>

According to a 2018 UNESCO report—“Situation Analysis of Education in Albania: Toward SDG4 Education 2030”—about 1 800 schools in Albania benefited from Internet services in 2013, with an average speed of 2 Mbit/s, though only 714 schools, or less than 50 per cent, had ICT laboratories.<sup>51</sup> In 2016, the country’s expenditure per student in secondary education was 9.82 per cent of GDP per capita, while the EU average for the same period was 23.02 per

<sup>44</sup> [www.unicef.org/albania/media/2871/file/OECD\\_Reviews\\_of\\_Evaluation\\_and\\_Assessment\\_in\\_Education\\_Albania.pdf](http://www.unicef.org/albania/media/2871/file/OECD_Reviews_of_Evaluation_and_Assessment_in_Education_Albania.pdf).

<sup>45</sup> [www.unicef.org/albania/media/2871/file/OECD\\_Reviews\\_of\\_Evaluation\\_and\\_Assessment\\_in\\_Education\\_Albania.pdf](http://www.unicef.org/albania/media/2871/file/OECD_Reviews_of_Evaluation_and_Assessment_in_Education_Albania.pdf).

<sup>46</sup> [www.unicef.org/albania/media/2871/file/OECD\\_Reviews\\_of\\_Evaluation\\_and\\_Assessment\\_in\\_Education\\_Albania.pdf](http://www.unicef.org/albania/media/2871/file/OECD_Reviews_of_Evaluation_and_Assessment_in_Education_Albania.pdf).

<sup>47</sup> [www.oecd-ilibrary.org/docserver/7f73878b-en.pdf?expires=1605526453&id=id&accname=guest&checksum=5A228BDE5E7519BDA456F270466ADE52](http://www.oecd-ilibrary.org/docserver/7f73878b-en.pdf?expires=1605526453&id=id&accname=guest&checksum=5A228BDE5E7519BDA456F270466ADE52).

<sup>48</sup> [www.unicef.org/albania/reports/cost-under-investment-education-and-ways-reduce-it](http://www.unicef.org/albania/reports/cost-under-investment-education-and-ways-reduce-it).

<sup>49</sup> Mimoza Gjokutaj, “Albania: The Situation of Pre-University Education” (Albanian Coalition for Child Education, Tirana, 2013).

<sup>50</sup> [www.unicef.org/albania/media/451/file/The%20Cost%20of%20Underinvestment%20in%20Education%20and%20ways%20to%20reduce%20it.pdf](http://www.unicef.org/albania/media/451/file/The%20Cost%20of%20Underinvestment%20in%20Education%20and%20ways%20to%20reduce%20it.pdf).

<sup>51</sup> <https://unesdoc.unesco.org/ark:/48223/pf0000266100>.

cent.<sup>52</sup> According to the OECD, there were 0.23 computers per student in Albania in 2018,<sup>53</sup> with 65.7 per cent being connected to the Internet.<sup>54</sup> According to the new draft education strategy for the period 2021–2026, the ratio of computers to students stood at 1:27—far from the EU standard of 1 for every 3 to 7 students. Moreover, 25 per cent of the total number of computers are not fully operational, indicating a lack of maintenance and a need for disused computers to be updated. Internet speed is not always adequate for online learning, and devices are mainly concentrated in one laboratory rather than spread across all school classrooms.<sup>55</sup>

### 3.1.3 Multistakeholder partnerships and financing mechanisms fostering investment in school connectivity

Multistakeholder partnerships for improving school connectivity have preceded and supported the developments that have spanned the past decade. For example, in 2009, the United Nations Development Programme (UNDP) provided financial support to the “e-School” programme in Albania, which provided the country’s primary and secondary schools with modern computer labs, high-speed, reliable Internet access, and training in information technology skills. Hundreds of schools were equipped, and thousands of teachers given ICT training.<sup>56</sup>

In 2012, the Albanian Government selected Eutelsat Communications as the satellite provider for its Digital Age of Communications Agenda, which was initiated to increase free public Internet access for Albanian citizens. In partnership with Albania-based Tring Communication, the project’s goal was to connect 850 post offices, schools and local government offices in rural areas to the Internet using the KA-SAT satellite.<sup>57</sup> In the context of the One Laptop per Child initiative in Albania, a previous government-led project focusing on satellite-enabled Internet facilitated a partnership between ALBtelecom and StarSat to deliver broadband via ASTRA2Connect.<sup>58</sup>

By 2014, the Education Excellence and Equity Project<sup>59</sup>—a USD 75 million partnership between Albania’s Government, the International Development Association, the World Bank and the European Investment Bank—had supported the construction or rehabilitation of 607 classrooms and laboratories and the provision of over 24 000 computers and Internet connectivity to schools. According to official data, the number of students per computer fell from 46 to 14 (urban) and 133 to 13 (rural).<sup>60</sup>

In the 2012 Broadband Strategy for Albania, the Government had already signalled its goal of providing high-speed and secure Internet access to schools, with at least one broadband

<sup>52</sup> <https://data.worldbank.org/indicator/SE.XPD.SECO.PC.ZS?locations=EU-AL>.

<sup>53</sup> Data for number of computers per student at school taken from the PISA 2018 Database Table V.B1.5.6, published May 2020 and available at <https://doi.org/10.1787/888934131253>.

<sup>54</sup> [https://gpseducation.oecd.org/IndicatorExplorer?plotter=h5&query=34&indicators=N051\\*N055\\*N160\\*S016\\*S017\\*S018\\*N052\\*N056\\*N057\\*R001\\*R005\\*N037\\*N038\\*N039\\*N040\\*N041\\*N042\\*T012\\*T013\\*C076\\*P005\\*P006\\*N050\\*T037\\*A256\\*A258\\*A263\\*A264\\*A265\\*P819\\*N122\\*N123\\*N236\\*N237\\*N238\\*N239](https://gpseducation.oecd.org/IndicatorExplorer?plotter=h5&query=34&indicators=N051*N055*N160*S016*S017*S018*N052*N056*N057*R001*R005*N037*N038*N039*N040*N041*N042*T012*T013*C076*P005*P006*N050*T037*A256*A258*A263*A264*A265*P819*N122*N123*N236*N237*N238*N239).

<sup>55</sup> Information from UNICEF Albania Country Office.

<sup>56</sup> <https://news.un.org/en/story/2009/07/307212-un-gives-technological-boost-500000-albanian-school-students>.

<sup>57</sup> [www.worldteleport.org/news/104616/Eutelsat-satellite-broadband-selected-for-free-public-Internet-access-in-Albania.htm](http://www.worldteleport.org/news/104616/Eutelsat-satellite-broadband-selected-for-free-public-Internet-access-in-Albania.htm).

<sup>58</sup> [http://wiki.laptop.org/go/Albanian\\_schools\\_and\\_Internet\\_connectivity](http://wiki.laptop.org/go/Albanian_schools_and_Internet_connectivity).

<sup>59</sup> [www.worldbank.org/en/results/2014/04/10/improving-quality-strengthening-governance-in-albania-education-system](http://www.worldbank.org/en/results/2014/04/10/improving-quality-strengthening-governance-in-albania-education-system).

<sup>60</sup> <https://documents.worldbank.org/en/publication/documents-reports/documentdetail/550711468009649019/ndertimin-e-nje-shkollte-re-9-vjacare-ne-paskuquan>.

connection in every classroom and 100 per cent of schools in the country covered.<sup>61</sup> Further government-led projects related to connectivity in schools have been under discussion ever since.

In June 2020, the Albanian Government approved and adopted the National Plan for Sustainable Development of Digital Infrastructure and Broadband 2020-2026. The new National Broadband Targets state that the Government's goal is to have 100 per cent of schools connected with high-speed broadband connectivity of 1 Gbit/s and access in every classroom by the end of 2025.

### 3.1.4 National responses to COVID-19 and educational initiatives for distance learning

In March 2020, the Albanian Council of Ministers ordered the closure of schools as part of the country's measures to slow the spread of COVID-19.<sup>62</sup> Since then, the COVID-19 emergency has become one of the main priorities of Albania's Ministry of Education, Sport and Youth, which established a task force to address challenges related to distance learning and implement novel educational strategies to ensure students' learning continuity and success.

With the school closures directly affecting more than half a million learners, the Ministry of Education, Sport and Youth published guidelines for learning in a home setting as a result of COVID-19 on 30 March 2020.<sup>63</sup> Furthermore, with support from the Independent Trade Union of Education (SPASH-ITUEA), the Ministry of Education initiated efforts to make lessons for all classes available daily on all national television channels,<sup>64</sup> with the aim of reaching more people and helping to ensure that every child, no matter his or her geographic location or technological capacity for Internet access, would be able to access educational resources.

Despite these initial efforts, the closures directly affected quality of learning, especially among the most vulnerable groups, who lack connectivity, the equipment necessary for online options, and a suitable household environment—frequently placing an extra burden on women. Recent data suggest that at least 11 000 students have been identified as not having access to online learning, many of them living in remote and rural areas with no Internet or devices at home, especially Roma children and children with learning difficulties and disabilities.<sup>65</sup> UNICEF has estimated that the percentage of "low performers" is likely to increase by about 8 per cent as a result of school closures from mid-March to June 2020.<sup>66</sup>

In April 2020, the Vodafone Albania Foundation launched the #RedForKids initiative. Partnering with the Albanian Ministry of Education, Sport and Youth, Vodafone Albania donated 15 000

<sup>61</sup> [https://www.google.com/search?q=undp-gives-technological-boost-to-schools-in-albania&rlz=1C1CHBF\\_itIT903IT903&oq=undp-gives-technological-boost-to-schools-in-albania&aqs=chrome..69i57.2413j0j4&sourceid=chrome&ie=UTF-8](https://www.google.com/search?q=undp-gives-technological-boost-to-schools-in-albania&rlz=1C1CHBF_itIT903IT903&oq=undp-gives-technological-boost-to-schools-in-albania&aqs=chrome..69i57.2413j0j4&sourceid=chrome&ie=UTF-8).

<sup>62</sup> <https://uk.reuters.com/article/uk-health-coronavirus-albania/albania-halts-schools-italy-flights-ferries-over-coronavirus-idUKKBN20W01E?il=0>.

<sup>63</sup> [www.wvi.org/sites/default/files/2020-06/COVID\\_Assesment\\_Report\\_WVA\\_final.pdf](http://www.wvi.org/sites/default/files/2020-06/COVID_Assesment_Report_WVA_final.pdf).

<sup>64</sup> [www.csee-etuice.org/en/policy-issues/covid-19/294-latest-updates/3673-albanian-education-union-uses-technology-to-reduce-impact-of-covid-19](http://www.csee-etuice.org/en/policy-issues/covid-19/294-latest-updates/3673-albanian-education-union-uses-technology-to-reduce-impact-of-covid-19).

<sup>65</sup> [www.unicef.org/albania/media/3101/file/UN%20ALBANIA%20COVID-19%20SOCIO-ECONOMIC%20RECOVERY%20&%20RESPONSE%20PLAN.pdf](http://www.unicef.org/albania/media/3101/file/UN%20ALBANIA%20COVID-19%20SOCIO-ECONOMIC%20RECOVERY%20&%20RESPONSE%20PLAN.pdf).

<sup>66</sup> [www.unicef.org/albania/media/3101/file/UN%20ALBANIA%20COVID-19%20SOCIO-ECONOMIC%20RECOVERY%20&%20RESPONSE%20PLAN.pdf](http://www.unicef.org/albania/media/3101/file/UN%20ALBANIA%20COVID-19%20SOCIO-ECONOMIC%20RECOVERY%20&%20RESPONSE%20PLAN.pdf).

smart devices and SIM cards with unlimited online learning data access to those children most in need.<sup>67</sup>

In May 2020, the Ministry of Health and Social Protection announced that the second phase of reopening would begin with the opening of preschools on 1 June.<sup>68</sup> In September 2020, primary and secondary schools returned to in-class instruction and were required to follow strict hygiene and sanitary protocols<sup>69</sup> by the Ministry of Health and Social Protection in order to prevent the spread of COVID-19. Schools with over 1 000 students were required to alternate classes in two, three or four shifts, and each class could have no more than 20 students.<sup>70</sup> The challenges in terms of resources and logistics for implementing these measures are apparent, as the education system in Albania was already experiencing significant strain owing to the consequences of a devastating earthquake in 2019, which had necessitated the transfer of approximately 21 000 children to other schools and the introduction of a shift system.

As a response to the pandemic, the Albanian Ministry of Education, Sport and Youth launched Akademi.al,<sup>71</sup> a free online platform available to support student learning across different levels. The platform, developed with financial and technical support from UNICEF, hosts an estimated 17 000 video explanations by selected teachers from all over the country, covering a wide variety of school subjects.<sup>72</sup> Some 7 000 additional video explanations were filmed by Albanian Radio Television and included on Akademi.al.<sup>73</sup> By the end of 2020, the platform had enabled 190 000 virtual lessons to take place and for learning to continue in a hybrid way, both face-to-face and online, reaching more than 462 000 students and with more than 33 000 teachers registered.<sup>74</sup> All video lessons are in the Albanian language, and subtitles, voice-overs and sign language for children with disabilities are being added. Along with asynchronous video lessons, the platform has introduced virtual classroom features for live learning, while students aged 3 to 18 from across Albania can also watch on national television.<sup>75</sup>

Moreover, the interactive platform has more recently introduced pre-school learning support. It now allows students and parents to collaborate in real time and track educational outcomes through grades, the status of tasks and homework, attendance, and other indicators. This is an important step in engaging parents in supporting the monitoring of their children's progress with distance learning. It is expected that the number of users on the platform will continue to grow throughout 2021, including through access to more personalized end-to-end learning experiences. At the same time, UNICEF continues to contribute to the project and has recently uploaded 1 100 new video lessons to support students with their national university entrance exams. Although the platform already complies with digital accessibility standards, the development of a mobile application is one of Akademi.al and UNICEF's objectives for the near future.<sup>76</sup> UNICEF is also engaging in dialogue with the Ministry of Education, Sport and Youth to ensure that the most vulnerable children also have access to digital learning

<sup>67</sup> <https://www.vodafone.com/covid19/news/vodafone-albania-foundation-redforkids>; <https://www.tiranapost.net/sociale/digitalizim-per-me-shume-akses-ne-arsim-673>.

<sup>68</sup> <http://shendetesia.gov.al/26-maj-2020-informacion-i-perditesuar-per-koronavirusin-covid-19/>.

<sup>69</sup> <https://balkaninsight.com/2020/08/20/albania-to-open-schools-in-september-despite-covid-19-risks/>.

<sup>70</sup> [www.xinhuanet.com/english/2020-09/15/c\\_139368057.htm](http://www.xinhuanet.com/english/2020-09/15/c_139368057.htm).

<sup>71</sup> [www.akademi.al/](http://www.akademi.al/).

<sup>72</sup> <https://gizmonova.com/the-online-platform-akademi-al-is-presented-for-all-students/>; updated information from UNICEF Albania Country Office.

<sup>73</sup> Updated Information provided by Albania's Ministry of Education, Sports and Youth.

<sup>74</sup> [www.unicef.org/media/88896/file/ECARO-COVID-19SitRepNo.15-22Oct-25Nov2020.pdf](http://www.unicef.org/media/88896/file/ECARO-COVID-19SitRepNo.15-22Oct-25Nov2020.pdf).

<sup>75</sup> [www.unicef.org/albania/stories/unicef-enables-children-albania-learn-online-through-akademial](http://www.unicef.org/albania/stories/unicef-enables-children-albania-learn-online-through-akademial).

<sup>76</sup> [www.unicef.org/albania/stories/unicef-enables-children-albania-learn-online-through-akademial](http://www.unicef.org/albania/stories/unicef-enables-children-albania-learn-online-through-akademial).

through the provision of tablets.<sup>77</sup> As a result of cooperation between UNICEF and the Ministry, 22 technology hubs serving more than 12 000 children by providing technology solutions and blended learning are being offered to Albanian schools. Each hub provides tablets with keyboards on a library-style basis so that children and teachers can use them according to their schedules. Children are able to take tablets home to participate in online classes, projects, etc., thereby addressing the issue of the digital gap for the most vulnerable children.

In terms of staff training for more effective remote teaching, other initiatives have been developed to help teachers prepare their lessons and make them as accessible as possible for students.<sup>78</sup> As of October 2020, the Government was supporting teachers through online training seminars, the provision of teaching content, and professional, psychosocial and emotional support.<sup>79</sup> Moreover, the Ministry of Education, Sports and Youth has, with support from UNICEF, developed ICT standards for teachers, alongside a methodology for accrediting teachers' ICT professional development and training.<sup>80</sup> This has accompanied continuing efforts to train teachers not only in how to use the national Akademi.al platform but also more broadly on the effective integration of ICTs for educational purposes.

A recent assessment of the impact of COVID-19 on the well-being of children, conducted by World Vision in Albania, has found that 1 in 10 children cannot access education activities online. The figure is even more stark for children with disabilities, half of whom do not have access.<sup>81</sup> Furthermore, a national study on children's experiences online carried out by UNICEF Albania during 2018 and 2019, "One Click Away", has found that parents' digital skills are much lower than those of children, with parents from low socio-economic groups being most affected.<sup>82</sup>

In July 2020, UNESCO and the Ministry of Education, Sport and Youth set up a pilot programme on media and information literacy in formal education, organized within the framework of the EU-funded project "Building Trust in Media in South-East Europe and Turkey - Phase 2."<sup>83</sup> As a response to growing concerns about misinformation and disinformation surrounding the COVID-19 pandemic, the project's main goal is to enhance youth skills in media and information literacy by introducing the subject into the formal educational system in the region. It is being developed in cooperation with Bosnia and Herzegovina. UNESCO has announced that the partnership will allow stakeholders to map and engage with all relevant resources and key actors in the field of education. Moreover, UNESCO has also announced that the drafting of a pilot media and information literacy curriculum for primary and secondary schools in Albania is well under way.<sup>84</sup> Another such project fostering effective digital media literacy is an app developed by the Ministry of Education, Sport and Youth and UNICEF, providing practical information to young people on how to distinguish facts from fake news online.<sup>85</sup>

<sup>77</sup> [https://albania.un.org/sites/default/files/2020-05/no.1-%20UNALB%20Covid%20Response\\_Issue%232.pdf](https://albania.un.org/sites/default/files/2020-05/no.1-%20UNALB%20Covid%20Response_Issue%232.pdf).

<sup>78</sup> [www.coe.int/en/web/education/schools-in-albania#\[%2263470963%22:\[0\],%2263470980%22:\[1\]\]](http://www.coe.int/en/web/education/schools-in-albania#[%2263470963%22:[0],%2263470980%22:[1]]).

<sup>79</sup> <http://tcg.uis.unesco.org/survey-education-covid-school-closures/>.

<sup>80</sup> [www.unicef.org/media/79706/file/ECARO-COVID19-SitRep-14-April-2020.pdf](http://www.unicef.org/media/79706/file/ECARO-COVID19-SitRep-14-April-2020.pdf).

<sup>81</sup> [www.worldvision.al/gjetjet-kryesore-te-vleresim-mbi-ndikimin-e-covid-19-ne-mireqenien-e-femijeve-dhe-familjeve-ne](http://www.worldvision.al/gjetjet-kryesore-te-vleresim-mbi-ndikimin-e-covid-19-ne-mireqenien-e-femijeve-dhe-familjeve-ne).

<sup>82</sup> [www.unicef.org/albania/media/3101/file/UN%20ALBANIA%20COVID-19%20SOCIO-ECONOMIC%20RECOVERY%20&%20RESPONSE%20PLAN.pdf](http://www.unicef.org/albania/media/3101/file/UN%20ALBANIA%20COVID-19%20SOCIO-ECONOMIC%20RECOVERY%20&%20RESPONSE%20PLAN.pdf).

<sup>83</sup> <https://en.unesco.org/trust-in-media-see>.

<sup>84</sup> <https://en.unesco.org/news/unesco-agrees-ministries-education-albania-and-sarajevo-pilot-mil-primary-and-secondary-schools>.

<sup>85</sup> <https://ictsmedia.qrd.by/yq0cgs>.

## 3.2 Bosnia and Herzegovina

### 3.2.1 Overview of the education system and status of broadband

The right to primary education is enshrined in the Constitution and legislation of Bosnia and Herzegovina. Primary education is free for all children in the country. As for compulsory education, the primary level lasts nine years, from age 6 to age 14.<sup>86</sup> It is most commonly provided using a “social status” criterion to ensure full and equal access to the regular education system. Secondary education, however, is not compulsory.<sup>87</sup> While reforms to the education system are still in progress, the system remains highly decentralized, which tends to perpetuate inefficiencies and inequities across education levels and results in an inefficient allocation of school resources.

The country has one of the lowest levels of access to primary education and one of the highest out-of-school rates for upper secondary-age adolescents—21 per cent—of the nine countries included in this study. Overall learning outcomes are below the EU average. Approximately 58.6 per cent of primary- and secondary-age students, more than 230 000, do not achieve minimum proficiency in the foundational skills needed for further learning and skills development,<sup>88</sup> presenting challenges for the planning and execution of policy frameworks. At present, the Ministry of Civic Affairs, UNESCO and Bosnia and Herzegovina’s Agency for Statistics are working on the development of indicators for reporting on SDG 4 and the Incheon Declaration on Education 2030.

In terms of organization, the education system in Bosnia and Herzegovina is highly fragmented, with as many as 14 government bodies responsible for the education of about 420 341 students enrolled from pre-primary to upper-secondary level.<sup>89, 90</sup> Consequently, the staffing costs for teachers, school staff and relevant others account for over 90 per cent of education spending, compared to an EU average of 77 per cent,<sup>91</sup> leaving very little room to invest in learning materials and equipment, provide training for teachers or upgrade school learning environments. Moreover, the education system continues to lack common standards for the different levels of education, as well as for teacher training and performance evaluation.<sup>92</sup>

A 2019 World Bank assessment shows that the country’s expenditure on education is about 4.6 per cent of GDP,<sup>93</sup> while the EU average was 4.7 per cent in 2017.<sup>94</sup> This means that Bosnia and Herzegovina spends more than some peers in the region, but less than the EU and OECD averages. Despite that, the distribution of education spending is inefficient and inequitable,

<sup>86</sup> <http://uis.unesco.org/en/country/ba>.

<sup>87</sup> [https://sustainabledevelopment.un.org/content/documents/23345VNR\\_BiH\\_ENG\\_Final.pdf](https://sustainabledevelopment.un.org/content/documents/23345VNR_BiH_ENG_Final.pdf).

<sup>88</sup> UNICEF calculation of the number of students in primary, lower secondary and upper secondary not achieving minimum proficiency in mathematics; data for Bosnia and Herzegovina are sourced from the latest available figures from UIS and PISA.

<sup>89</sup> <https://blogs.worldbank.org/europeandcentralasia/realizing-educations-promise-bosnia-and-herzegovina-case-investing-children>.

<sup>90</sup> <http://data.uis.unesco.org/#> (Indicators: enrolment in pre-primary education, both sexes; enrolment in primary education, both sexes; enrolment in secondary education, both sexes.)

<sup>91</sup> <https://blogs.worldbank.org/europeandcentralasia/realizing-educations-promise-bosnia-and-herzegovina-case-investing-children>.

<sup>92</sup> [https://ec.europa.eu/neighbourhood-enlargement/sites/near/files/bosnia\\_and\\_herzegovina\\_report\\_2020.pdf](https://ec.europa.eu/neighbourhood-enlargement/sites/near/files/bosnia_and_herzegovina_report_2020.pdf).

<sup>93</sup> <http://documents1.worldbank.org/curated/en/719981571233699712/pdf/Bosnia-and-Herzegovina-Review-of-Efficiency-of-Services-in-Pre-University-Education-Phase-I-Stocktaking.pdf>.

<sup>94</sup> <https://data.worldbank.org/indicator/SE.XPD.SECO.PC.ZS?locations=EU>.

as it is disproportionately skewed towards personnel, which leaves little room for investments needed to improve the quality of service delivery.<sup>95</sup>

UNICEF data show that the literacy rate for the 15-24 years age group in Bosnia and Herzegovina is 99.7 per cent, while the completion rate for children of primary school age is 99.6 per cent.<sup>96</sup> The adjusted net attendance rate for young people of upper secondary age is 91.8 per cent.<sup>97</sup> Furthermore, as reported by the European Commission, although early childhood education and care enrolment remains very low, the trend is positive, and the figure now stands at around 12 per cent. As for pre-school enrolment of those aged 3 to 6 years, Bosnia and Herzegovina has the lowest enrolment figure in Europe at 25 per cent, which includes only 3 per cent of Roma children. Access to primary and secondary education in the country is satisfactory, with 97.6 per cent of children attending primary and 84.6 per cent attending secondary education. Among Roma children, 69 per cent attend primary education, but that figure drops to 23 per cent for secondary education.<sup>98</sup>

Regarding broadband development, according to ITU data 73.2 per cent of individuals in the country used the Internet in 2020.<sup>99</sup> Despite existing ICT divides, data estimates show a significant increase in terms of Internet penetration over the years, particularly from 2013 onwards. In 2019, the number of fixed-broadband subscriptions per 100 inhabitants was 21.5.<sup>100</sup> According to the Communications Regulatory Agency (RAK), Bosnia and Herzegovina currently has 67 Internet service providers.<sup>101</sup> For 2019, ITU data show that the proportion of households with Internet access at home was 72 per cent,<sup>102</sup> which is similar to what is found in other countries in the Western Balkan region. RAK data also show that the dominant type of Internet access remains xDSL, which accounted for 56.8 per cent of total broadband subscriptions, followed by cable access with 33.4 per cent.<sup>103</sup> The regulator also states that further liberalization of the telecommunication market and the introduction of new technologies are expected in the coming years.

Concerning the mobile sector, Bosnia and Herzegovina had a penetration rate of 47.3 mobile-broadband subscriptions per 100 inhabitants in 2019.<sup>104</sup> In terms of coverage, 3G covered 100 per cent of the population in 2020, while 4G/LTE covered 82 per cent of Bosnia and Herzegovina's population in 2019.<sup>105</sup> In the context of schools, a 2020 study by UNICEF and RAK surveying habits and parental attitudes to media usage reveals that 93 per cent of children in

<sup>95</sup> <http://documents1.worldbank.org/curated/en/719981571233699712/pdf/Bosnia-and-Herzegovina-Review-of-Efficiency-of-Services-in-Pre-University-Education-Phase-I-Stocktaking.pdf>.

<sup>96</sup> [https://data.unicef.org/resources/data\\_explorer/unicef\\_f?ag=UNICEF&df=GLOBAL\\_DATAFLOW&ver=1.0&dq=BIH.ED\\_CR\\_L1.&startPeriod=1970&endPeriod=2020](https://data.unicef.org/resources/data_explorer/unicef_f?ag=UNICEF&df=GLOBAL_DATAFLOW&ver=1.0&dq=BIH.ED_CR_L1.&startPeriod=1970&endPeriod=2020).

<sup>97</sup> [https://data.unicef.org/resources/data\\_explorer/unicef\\_f?ag=UNICEF&df=GLOBAL\\_DATAFLOW&ver=1.0&dq=BIH.ED\\_ANAR\\_L3.&startPeriod=1970&endPeriod=2020](https://data.unicef.org/resources/data_explorer/unicef_f?ag=UNICEF&df=GLOBAL_DATAFLOW&ver=1.0&dq=BIH.ED_ANAR_L3.&startPeriod=1970&endPeriod=2020).

<sup>98</sup> [https://ec.europa.eu/neighbourhood-enlargement/sites/near/files/bosnia\\_and\\_herzegovina\\_report\\_2020.pdf](https://ec.europa.eu/neighbourhood-enlargement/sites/near/files/bosnia_and_herzegovina_report_2020.pdf).

<sup>99</sup> ITU World Telecommunication/ICT Indicators Database online (2021), available at <http://handle.itu.int/11.1002/pub/81550f97-en> (indicator i99H).

<sup>100</sup> ITU World Telecommunication/ICT Indicators Database online (2021), available at <http://handle.itu.int/11.1002/pub/81550f97-en> (indicator i992b).

<sup>101</sup> Contact RIPE for more information <https://www.ripe.net/>.

<sup>102</sup> [www.itu.int/en/ITU-D/Statistics/Documents/statistics/2019/CoreHouseholdIndicators.xlsx](http://www.itu.int/en/ITU-D/Statistics/Documents/statistics/2019/CoreHouseholdIndicators.xlsx).

<sup>103</sup> [www.sarajevotimes.com/bh-communications-regulatory-agency-issues-report-on-number-of-Internet-users/](http://www.sarajevotimes.com/bh-communications-regulatory-agency-issues-report-on-number-of-Internet-users/)

<sup>104</sup> ITU World Telecommunication/ICT Indicators Database online (2020), available at <http://handle.itu.int/11.1002/pub/81550f97-en> (indicator i911mw).

<sup>105</sup> ITU World Telecommunication/ICT Indicators Database online (2021), available at <http://handle.itu.int/11.1002/pub/81550f97-en> (indicators i271G and i271GA).

the country have access to a smartphone, with about 90 of children aged 7 to 18 using mobile phones or smartphones daily and use increasing with age.<sup>106</sup>

With recent advances in legislation, Bosnia and Herzegovina has attempted to mirror the EU regulatory framework in terms of broadband mapping in the country, thereby establishing two main geo-portals<sup>107</sup> that provide a good basis for use and integration of spatial data.<sup>108</sup> However, Bosnia and Herzegovina is not endowed with a nationwide broadband mapping system for telecommunication infrastructure or services.<sup>109</sup> RAK is currently undertaking substantial work on service mapping at the level of statistical gathering, though not yet with georeferencing, as is foreseen for service mapping. Additionally, a fragmented jurisdictional system that prevents collaboration and the lack of regulations obliging operators to provide the agency with data on infrastructure and services remain two of the main barriers to progress in the field. It is important to note that RAK is currently taking steps, together with the Ministry of Communications and Transport, to adopt a broadband strategy and create an enabling environment both to coordinate the development of broadband infrastructure and service mapping and to introduce investment and demand mapping layers by relying on existing geoportal databases, in line with the EU regulatory framework.<sup>110</sup>

### 3.2.2 Government strategies, status of education quality, and the role of ICTs

In 2003, the Parliamentary Assembly of Bosnia and Herzegovina adopted the Framework Act on Primary and Secondary Education, which covers matters relating to levels of education, common curricula, standards in education, the rights and obligations of parents, the role and responsibilities of schools, and other details relevant to school management. The Act also establishes the general goals of education in Bosnia and Herzegovina to create a value system for the country's national, historical, cultural and religious traditions. According to the Act, the general goals of education are:<sup>111</sup>

- Providing access to knowledge as a basis for understanding oneself, others and the world in which one lives;
- Ensuring optimal development for every person, including those with special needs, in accordance with their age, capacity and mental and physical abilities;
- Promoting respect for human rights and fundamental freedoms and preparing each individual for life in a society that respects the principles of democracy and the rule of law;
- Developing an awareness of belonging to the State of Bosnia and Herzegovina and knowledge of one's own cultural identity, language and tradition in a manner appropriate to the achievements of civilization, while getting to know and respecting different people, respecting differences and fostering mutual understanding, tolerance and solidarity among all peoples, nations and communities in Bosnia and Herzegovina and the world;

<sup>106</sup> [www.unicef.org/bih/en/press-releases/93-children-bosnia-and-herzegovina-have-access-smartphones](http://www.unicef.org/bih/en/press-releases/93-children-bosnia-and-herzegovina-have-access-smartphones).

<sup>107</sup> [www.fgu.com.ba/en/572.html](http://www.fgu.com.ba/en/572.html) & <http://www.geoportal.rgurs.org/geoportal/>.

<sup>108</sup> [www.itu.int/en/ITU-D/Regional-Presence/Europe/Documents/Events/2019/Mapping%20Warsaw/KOVACEVIC%20-%20BB%20Mapping\\_%20B%26H\\_%20July%202019.pdf](http://www.itu.int/en/ITU-D/Regional-Presence/Europe/Documents/Events/2019/Mapping%20Warsaw/KOVACEVIC%20-%20BB%20Mapping_%20B%26H_%20July%202019.pdf).

<sup>109</sup> [www.itu.int/en/ITU-D/Regional-Presence/Europe/Documents/Events/2020/RRF/20-11-26%20Background%20Paper\\_Broadband%20Mapping%20Systems%20in%20Europe%20and%20Regional%20Harmonization%20Initiatives\\_final.pdf](http://www.itu.int/en/ITU-D/Regional-Presence/Europe/Documents/Events/2020/RRF/20-11-26%20Background%20Paper_Broadband%20Mapping%20Systems%20in%20Europe%20and%20Regional%20Harmonization%20Initiatives_final.pdf).

<sup>110</sup> [www.itu.int/en/ITU-D/Regional-Presence/Europe/Documents/Events/2020/RRF/20-11-26%20Background%20Paper\\_Broadband%20Mapping%20Systems%20in%20Europe%20and%20Regional%20Harmonization%20Initiatives\\_final.pdf](http://www.itu.int/en/ITU-D/Regional-Presence/Europe/Documents/Events/2020/RRF/20-11-26%20Background%20Paper_Broadband%20Mapping%20Systems%20in%20Europe%20and%20Regional%20Harmonization%20Initiatives_final.pdf).

<sup>111</sup> [http://fmon.gov.ba/Upload/Dokumenti/7e1e8c33-c594-4784-817a-e46de79149fa\\_Okvirni%20zakon%20o%20osnovnom%20i%20srednjem%20obrazovanju%20u%20Bosni%20i%20Hercegovini.pdf](http://fmon.gov.ba/Upload/Dokumenti/7e1e8c33-c594-4784-817a-e46de79149fa_Okvirni%20zakon%20o%20osnovnom%20i%20srednjem%20obrazovanju%20u%20Bosni%20i%20Hercegovini.pdf).



- Ensuring equal opportunities for education and choice at all levels of education, regardless of gender, race, nationality, social and cultural origin and status, family status, religion, and psychophysical or other personal characteristics;
- Achieving high-quality education for citizens;
- Achieving standards of knowledge comparable with international or European equivalents, which ensure the inclusion and continuation of schooling within the European education system;
- Encouraging lifelong learning;
- Promoting economic development;
- Inclusion in the process of European integration.

According to OECD PISA results for 2018<sup>112</sup>, Bosnia and Herzegovina showed low levels in reading, mathematics and science literacy.<sup>113</sup> The results also indicated that the minimum level of achievement was not being reached by 58 per cent of students in mathematics, 54 per cent in reading and 57 per cent in science, while at the same time less than 1 per cent of examinees achieved maximum results.<sup>114</sup> Following the same trend found in other Western Balkan countries, economically advantaged students outperformed disadvantaged students in reading.

Regardless, about 13 per cent of disadvantaged students in Bosnia and Herzegovina managed to score in the top quartile for reading performance, indicating that economic disadvantage does not always determine performance. The PISA results also showed that school principals in Bosnia and Herzegovina reported fewer staff shortages and more material shortages than the OECD average, but that there was no significant difference in staff shortages between advantaged and disadvantaged schools.<sup>115</sup> Moreover, a 2020 assessment report by the European Commission shows that access to early childhood education and care is still low, while school enrolment rates have dropped in most sections of the education system, partly a result of demographic dynamics, such as declining birth rates and the emigration of young families.<sup>116</sup>

As shown by a series of UNESCO reports, the provision of the basic right to education is often jeopardized by several challenges, which result primarily from lack of sufficient financial resources. According to the Ministry of Civil Affairs of Bosnia and Herzegovina, some of the core reasons why certain children leave education or remain excluded from education are systematically embedded in the country's difficult social and economic situation, including unemployment and education levels among parents, the network of primary schools, difficulties related to the registration of children (especially when it comes to Roma children—about 58 000 across the country<sup>117</sup>—and children from socially marginalized families), traffic-separated areas, poor infrastructure and lack of support for children with disabilities.<sup>118</sup>

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<sup>112</sup> PISA tests the reading, mathematics and science performance of 15-year-old pupils across the world every three years. In the context of the EU, PISA results are particularly important because they feed into the Education and Training 2020 strategic cooperation framework (ET2020). They form the basis for one of the ET2020 benchmarks: the rate of underachievers in reading, mathematics or science among 15-year-olds in the EU should be less than 15 per cent by 2020. Underachievers in PISA are those pupils who fail to reach the minimum proficiency level necessary to participate successfully in society. More information on the PISA indicators and ET2020 is available at [https://ec.europa.eu/education/sites/education/files/document-library-docs/pisa-2018-eu\\_1.pdf](https://ec.europa.eu/education/sites/education/files/document-library-docs/pisa-2018-eu_1.pdf).

<sup>113</sup> [https://eacea.ec.europa.eu/national-policies/eurydice/content/national-reforms-school-education-8\\_en](https://eacea.ec.europa.eu/national-policies/eurydice/content/national-reforms-school-education-8_en).

<sup>114</sup> [https://eacea.ec.europa.eu/national-policies/eurydice/content/national-reforms-school-education-8\\_en](https://eacea.ec.europa.eu/national-policies/eurydice/content/national-reforms-school-education-8_en).

<sup>115</sup> [www.oecd.org/pisa/publications/PISA2018\\_CN\\_BIH.pdf](http://www.oecd.org/pisa/publications/PISA2018_CN_BIH.pdf).

<sup>116</sup> [https://ec.europa.eu/neighbourhood-enlargement/sites/near/files/bosnia\\_and\\_herzegovina\\_report\\_2020.pdf](https://ec.europa.eu/neighbourhood-enlargement/sites/near/files/bosnia_and_herzegovina_report_2020.pdf).

<sup>117</sup> [https://ec.europa.eu/neighbourhood-enlargement/sites/near/files/bosnia\\_and\\_herzegovina\\_report\\_2020.pdf](https://ec.europa.eu/neighbourhood-enlargement/sites/near/files/bosnia_and_herzegovina_report_2020.pdf).

<sup>118</sup> <https://unesdoc.unesco.org/ark:/48223/pf0000229929>.

Moreover, schools located in remote areas still lack infrastructure and pre-school programs, which disproportionately affects marginalized communities. For instance, a World Bank study on Bosnia and Herzegovina has shown that children from poor and rural backgrounds are less likely to attend secondary school and more likely to drop out of school.<sup>119</sup> This is particularly relevant for the Roma community, which is recognized as the largest, most neglected and most vulnerable minority in Bosnia and Herzegovina.<sup>120</sup> Despite recent improvements, Roma enrolment in education is significantly lower than for non-Roma students, especially in primary and secondary education. In terms of school infrastructure, there are strong indications demonstrating that learning outcomes are highly correlated with students' aspirations, socio-economic status, and other school characteristics. Moreover, rural girls in Bosnia and Herzegovina tend to get less education than boys,<sup>121</sup> but, despite the geographic challenges, rural children overall receive on average as many, or more, years of education as those in urban areas.<sup>122</sup>

Mapping the location of schools has also long been a challenge for Bosnia and Herzegovina. As the country underwent urbanization and developed more economic structures throughout its territory, communities moved to different geographic regions, which presents a challenge to understanding how best to locate schools in relation to the populations served.<sup>123</sup> Similarly, the scattered availability of statistics and a lack of up-to-date, comprehensive, country-wide surveys and data collection systems in several sectors remain one of the core challenges for effective evidence-based decision-making at the school level.<sup>124</sup> While there is a legal framework regulating the collection and systematization of data for the country at both national and cantonal levels, education and school statistics and data are patchy.<sup>125</sup>

In terms of the digitalization of the school system, there is no unique or harmonized data system collecting data on education. Furthermore, ICT infrastructure differs from school to school and between and within cantons, despite recent reforms attempting to tackle the issue. In terms of computer and Internet access at schools across Bosnia and Herzegovina, secondary schools are better equipped with computers than primary schools.<sup>126</sup> According to combined data from the OECD's PISA assessment and the Agency for Statistics of Bosnia and Herzegovina, there are about 125 605 computers in schools in Bosnia and Herzegovina, or one for every 3.3 students, 73.6 per cent of which have an Internet connection available. Nevertheless, when taking into account the number of teachers and students, both primary and secondary schools are poorly equipped. A World Bank report shows that there is one computer per four teachers on average in primary schools, while there is one per three teachers in secondary schools. For students, there is one computer per 14 students in primary schools, and one per 12 students in secondary schools.<sup>127</sup>

<sup>119</sup> <http://documents1.worldbank.org/curated/en/719981571233699712/pdf/Bosnia-and-Herzegovina-Review-of-Efficiency-of-Services-in-Pre-University-Education-Phase-I-Stocktaking.pdf>.

<sup>120</sup> According to the latest population census (2013), 12 479 people in Bosnia and Herzegovina self-identified as Roma, which corresponds to approximately 4 per cent of the total population. Nevertheless, as shown by the World Bank, the number may be underestimated owing to social stigma.

<sup>121</sup> [www.ilo.org/wcmsp5/groups/public/---dgreports/---gender/documents/publication/wcms\\_170832.pdf](http://www.ilo.org/wcmsp5/groups/public/---dgreports/---gender/documents/publication/wcms_170832.pdf).

<sup>122</sup> [http://hdr.undp.org/sites/default/files/nhdr\\_en\\_web\\_30102013.pdf](http://hdr.undp.org/sites/default/files/nhdr_en_web_30102013.pdf).

<sup>123</sup> [https://unesdoc.unesco.org/ark:/48223/pf0000109215\\_eng](https://unesdoc.unesco.org/ark:/48223/pf0000109215_eng).

<sup>124</sup> [www.unicef.org/about/annualreport/files/Bosnia-and-Herzegovina-2019-COAR\(1\).pdf](http://www.unicef.org/about/annualreport/files/Bosnia-and-Herzegovina-2019-COAR(1).pdf).

<sup>125</sup> <http://documents1.worldbank.org/curated/en/121621571233909890/pdf/Bosnia-and-Herzegovina-Review-of-Efficiency-of-Services-in-Pre-University-Education-Phase-I-Stocktaking.pdf>.

<sup>126</sup> [www.etf.europa.eu/sites/default/files/2020-06/digital\\_factsheet\\_bosnia\\_and\\_herzegovina\\_0.pdf](http://www.etf.europa.eu/sites/default/files/2020-06/digital_factsheet_bosnia_and_herzegovina_0.pdf).

<sup>127</sup> <http://measurebih.com/uimages/MEASURE-BiH20BEA20Follow-on20Assessment20Final.pdf>; <https://blogs.worldbank.org/europeandcentralasia/realizing-educations-promise-bosnia-and-herzegovina-case-investing-children>.

When it comes to digitalizing the curriculum, a low level of digital skills among teachers and other school staff is hindering progress. The country's common core curriculum provides a comprehensive approach to integrating digital skills and competencies. In particular, the document "Priorities in integrating entrepreneurial and digital competence into education systems in Bosnia and Herzegovina 2019-2030" aims to bring digital skills competencies into line with the European Digital Competence Framework (DigComp). However, while employment in the ICT sector is increasing by approximately 15 per cent annually, ICT and digital skills training programmes are still in the development phase. Distance learning in the country is in its infancy, and, despite the recent development in e-learning tools, teachers still struggle to adapt to new teaching techniques.<sup>128</sup> Education authorities at all levels of the education system in Bosnia and Herzegovina recognize the importance of digital and blended learning, not only during but also beyond the pandemic. However, the intended outcomes of education digitalization and improvement, as well as the specific means to reach them, remain to be clearly defined, particularly with regard to the integration of digital and blended learning with the curriculum, underscoring the need for a more coherent and strategic vision.<sup>129</sup>

### 3.2.3 Multistakeholder partnerships and financing mechanisms fostering investment in school connectivity

The Electronic Communications Sector Policy of Bosnia and Herzegovina for 2017-2021,<sup>130</sup> which is aligned with the Digital Agenda for Europe,<sup>131</sup> elaborates on the expansion of broadband infrastructure in less developed and populated areas. In the context of Internet connectivity in schools across the country, the policy's action plan explicitly focuses on technical preconditions for the implementation of broadband Internet access for all users, especially schools and educational institutions.<sup>132</sup> However, no additional detail or specific programme for the delivery of school connectivity is identifiable in the country.

### 3.2.4 National responses to COVID-19 and educational initiatives for distance learning

In mid-March 2020, in-class instruction across Bosnia and Herzegovina ceased as schools closed owing to the COVID-19 pandemic. As a result, many teachers had to relocate their activities to digital platforms and nearly half a million students had to adapt to new ways of learning while keeping abreast with the common core programme. This has exacerbated existing disparities among certain groups, especially those belonging to minority communities and those from rural areas. From innovations such as app developments to web portals for learning, many students, teachers and families found ways to circumvent the challenges imposed by the closure of schools.<sup>133</sup> Additionally, separate online platforms for the Bosnian and Croat language curricula are being used in the Herzegovina-Neretva and Central Bosnia cantons.<sup>134</sup>

<sup>128</sup> <https://ieee-dataport.org/documents/e-learning-bosnia-and-herzegovina-classrooms>.

<sup>129</sup> UNICEF Country Office responding to "Reimagine education" questionnaire.

<sup>130</sup> <http://www.sluzbenilist.ba/page/akt/WBr1TX3CmYY%3D>.

<sup>131</sup> [https://ec.europa.eu/neighbourhood-enlargement/system/files/2020-10/bosnia\\_and\\_herzegovina\\_report\\_2020.pdf](https://ec.europa.eu/neighbourhood-enlargement/system/files/2020-10/bosnia_and_herzegovina_report_2020.pdf).

<sup>132</sup> [www.sluzbenilist.ba/page/akt/WBr1TX3CmYY=](http://www.sluzbenilist.ba/page/akt/WBr1TX3CmYY=).

<sup>133</sup> [www.unicef.org/bih/en/stories/children-and-youth-need-safer-and-better-schools](http://www.unicef.org/bih/en/stories/children-and-youth-need-safer-and-better-schools).

<sup>134</sup> [https://ec.europa.eu/neighbourhood-enlargement/sites/near/files/bosnia\\_and\\_herzegovina\\_report\\_2020.pdf](https://ec.europa.eu/neighbourhood-enlargement/sites/near/files/bosnia_and_herzegovina_report_2020.pdf).

Despite the initial challenges, the continuation of education was ensured primarily through ad hoc solutions for distance learning and the delivery of learning content on television. As for enrolment in early childhood education and care, as well as in first grade, the majority of institutions have issued instructions for online applications. Nonetheless, delivery of e-learning for young children presented particular challenges. As of March 2020, 82 per cent of children who attended pre-school prior to the pandemic had interrupted their education, with just 13 per cent of children aged 3 to 6 attending online pre-school.<sup>135</sup> Enrolment in secondary schools and universities was conducted online by a limited number of institutions.<sup>136</sup>

As the pandemic evolved in Bosnia and Herzegovina, the education authorities attempted to quickly establish different mechanisms for distance learning and also partnered with relevant international organizations. To help safeguard effective and continuous learning in the face of the challenges presented by the pandemic, UNICEF put forth an initiative in May 2020, in collaboration with the education authorities in Sarajevo canton, connecting teachers to experts in the areas of education theory, education technology, government administration and quality of online education.<sup>137</sup> UNICEF also provided Internet access to 1 968 children in Republika Srpska to ensure their learning continuity. Additionally, UNICEF delivered learning materials (early childhood development kits, school-in-a-box, televisions/receivers for distance learning, tablets) to government counterparts (the Ministry of Education), children—including those in the most disadvantaged families and in residential schools for children in contact with the law—and at refugee reception centres,<sup>138</sup> supporting over 100 000 children in Bosnia and Herzegovina with distance or home-based learning by the end of 2020. Such efforts have complemented schools' distribution of printed materials for children without access to digital learning and teachers' provision of support and learning instructions via telephone.<sup>139</sup>

According to a rapid needs assessment undertaken during the pandemic, education authorities reported a 50 per cent decrease in the number of children unable to access ICTs and the Internet from the first to the second phase of assessment, which is reported as likely to be the result of support from both the international community and local resource mobilization by education authorities.<sup>140</sup>

In terms of emergency policy interventions, UNICEF brought together international organizations working in education in Bosnia and Herzegovina to harmonize approaches and interventions. UNICEF presented the findings from a rapid needs assessment on children's learning, and the report has been shared with stakeholders and donors.<sup>141</sup> UNICEF also compiled a document entitled "Open Digital Educational Tools for Interactive Communication", containing a list of tools for educators to use in their teaching practices.<sup>142</sup>

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<sup>135</sup> [https://bosniaherzegovina.un.org/sites/default/files/2020-10/UNICEF\\_UNESCO%20RNA%20%20Phase%202\\_final.pdf](https://bosniaherzegovina.un.org/sites/default/files/2020-10/UNICEF_UNESCO%20RNA%20%20Phase%202_final.pdf).

<sup>136</sup> [https://ec.europa.eu/neighbourhood-enlargement/sites/near/files/bosnia\\_and\\_herzegovina\\_report\\_2020.pdf](https://ec.europa.eu/neighbourhood-enlargement/sites/near/files/bosnia_and_herzegovina_report_2020.pdf).

<sup>137</sup> [www.unicef.org/eca/media/11826/file](http://www.unicef.org/eca/media/11826/file).

<sup>138</sup> [www.unicef.org/eca/media/11611/file](http://www.unicef.org/eca/media/11611/file).

<sup>139</sup> [https://bosniaherzegovina.un.org/sites/default/files/2020-10/UNICEF\\_UNESCO%20RNA%20%20Phase%202\\_final.pdf](https://bosniaherzegovina.un.org/sites/default/files/2020-10/UNICEF_UNESCO%20RNA%20%20Phase%202_final.pdf).

<sup>140</sup> [https://bosniaherzegovina.un.org/sites/default/files/2020-10/UNICEF\\_UNESCO%20RNA%20%20Phase%202\\_final.pdf](https://bosniaherzegovina.un.org/sites/default/files/2020-10/UNICEF_UNESCO%20RNA%20%20Phase%202_final.pdf).

<sup>141</sup> [www.unicef.org/eca/media/11611/file](http://www.unicef.org/eca/media/11611/file).

<sup>142</sup> [www.unicef.org/bih/media/5061/file/Open%20Digital%20Educational%20Tools%20for%20Interactive%20Communication.pdf](http://www.unicef.org/bih/media/5061/file/Open%20Digital%20Educational%20Tools%20for%20Interactive%20Communication.pdf).

Aside from computer-based forms of learning, the Government of Bosnia and Herzegovina has also organized an educational programme via the country's public broadcast radio and television stations for its elementary students. Although these learning platforms are free of charge, the starting approaches have differed significantly from canton to canton in the initial weeks, depending on access to technical resources, the digital competencies of educational workers, and local politicians' capacity to respond to the extraordinary situation.<sup>143</sup> However, there are discrepancies in the scope and quality of these services of education broadcasting within the country, mainly because of a lack of both necessary equipment and an overall strategy for teachers and students to ensure quality in distance learning, including in the assessment of students' progress.<sup>144</sup>

Regarding support for teachers, the Government reports that teachers were provided with online training, access to ICT tools and connectivity, but that some cuts to teachers' salaries were implemented. UNICEF has provided psychosocial and mental health support to teachers at the primary and secondary levels and has supported the training of teachers in delivering distance learning, reaching more than 4 600 teachers by the end of 2020.<sup>145</sup>

UNICEF and UNESCO have strongly advocated for education to be prioritized in the pandemic response, working closely with national education authorities to support the dissemination of the Framework for Reopening Schools.<sup>146</sup> UNICEF has provided multiple evidence-based global resources to education authorities, which have been used for delivering online learning and planning safe school reopening. As in other countries throughout the region, UNICEF is complementing the government's response in areas such as family and community outreach to ensure that students return to school. In September 2020, elementary school students up to fourth grade returned to classrooms in Republika Srpska and the Sarajevo and Goražde cantons (with shorter teaching periods and classes with a maximum of 15 students), following strict hygiene measures such as obligatory mask-wearing.<sup>147</sup> On 25 October, Republika Srpska provisionally suspended teaching in primary and secondary schools, bringing all classes online.<sup>148</sup> The ongoing transitions among face-to-face instruction and distance learning, partially or for the entire education system, demonstrate the importance of investing in ICT infrastructure, connectivity and high-quality digital learning to ensure continuity and coherence in education service delivery during this crisis and beyond. This is particularly critical for the most marginalized children in Bosnia and Herzegovina, including Roma children and children with disabilities. UNICEF's support for selected education authorities in analysing the quality of digital learning is planned to inform the strategic vision for digital learning in Bosnia and Herzegovina.<sup>149</sup>

<sup>143</sup> <https://china-cee.eu/2020/05/25/bosnia-herzegovina-social-briefing-impact-of-covid-19-lockdown-measures-on-education-and-culture-during-march-and-april/>.

<sup>144</sup> [https://ec.europa.eu/neighbourhood-enlargement/sites/near/files/bosnia\\_and\\_herzegovina\\_report\\_2020.pdf](https://ec.europa.eu/neighbourhood-enlargement/sites/near/files/bosnia_and_herzegovina_report_2020.pdf).

<sup>145</sup> UNICEF Humanitarian Action for Children regional indicator reporting.

<sup>146</sup> [www.unicef.org/media/93756/file/ECAR%20COVID-19%20Situation%20Report%20No.%2016%20End%20of%20year%202020.pdf](http://www.unicef.org/media/93756/file/ECAR%20COVID-19%20Situation%20Report%20No.%2016%20End%20of%20year%202020.pdf).

<sup>147</sup> <https://balkaninsight.com/2020/09/01/some-balkan-central-european-states-open-schools-despite-covid-19/>.

<sup>148</sup> [www.oecd.org/south-east-europe/COVID-19-Crisis-in-Bosnia-and-Herzegovina.pdf](http://www.oecd.org/south-east-europe/COVID-19-Crisis-in-Bosnia-and-Herzegovina.pdf).

<sup>149</sup> UNICEF Country Office responding to "Reimagine education" questionnaire.

### 3.3 Georgia

#### 3.3.1 Overview of the education system and status of broadband

Under Article 35 of the Constitution of the Republic of Georgia,<sup>150</sup> everyone has the right to education, as education is a fundamental human right and essential for the exercise of all other human rights. In 1997, the parliament of Georgia approved the Education Act, defining the main principles of its state education policy and safeguarding the right to education for every citizen regardless of race, ethnicity, nationality, sex, religion, and socio-economic status. The legislation emphasizes the importance of having a unified education system throughout the country. It also creates the conditions for decentralized administration and knowledge transfer, together with a system that values the humanistic, scientific and democratic character of education for upward social mobility.

The 2005 General Education Act established a 12-year cycle of school education and made education compulsory from the age of six. Georgia's general education system is divided into three stages: primary education (grades 1 to 6), basic education or lower secondary (grades 7 to 9) and upper/general secondary education (grades 10 to 12).<sup>151</sup> Formal vocational education and training is split into two stages: initial vocational education (apprenticeship) and higher education and training. Over the past two decades, in particular, significant improvements in educational outcomes in the country have occurred, though that progress has not been equitable across all population groups.<sup>152</sup> To address these and other challenges, the Government has approved several reforms in the past two decades, focusing on the decentralization of school governance and the development of competence-based curricula, coupled with effective teacher development.<sup>153</sup>

In terms of organization, the education system in Georgia falls under the responsibility of the Minister of Education, Science, Culture and Sport, along with three deputy ministers. With a highly decentralized system, schools in Georgia operate with significant autonomy, allowing them to proceed with hiring teachers, adapting to the national curriculum, and managing financial resources from the Government. With such freedom, schools can tailor education to the needs of their own student bodies. As pointed out by the OECD, however, there is evidence that, even among schools with the same number of students, some schools request and receive up to three times as much funding as others. While schools in Georgia may require effective central support, there are inadequate oversight mechanisms to systematically identify critical issues and provide support where it is most needed.<sup>154</sup>

According to data from the Ministry of Education, Science, Culture and Sport, for the academic year 2020-2021 there are 2 309 schools in Georgia: 2 086 public and 223 private.<sup>155</sup> These schools have some 609 095 students.<sup>156</sup> At the beginning of the 2020-2021 school year, 62 699 teachers were employed in general education institutions, which is 1.7 per cent less than the

<sup>150</sup> <https://matsne.gov.ge/en/document/view/30346>.

<sup>151</sup> [www.mes.gov.ge/uploads/Licenzireba/kanoni%20zogadi%20ganatlebis%20shesaxeb.pdf](http://www.mes.gov.ge/uploads/Licenzireba/kanoni%20zogadi%20ganatlebis%20shesaxeb.pdf); updated information provided by the UNICEF Country Office for Georgia.

<sup>152</sup> [www.unicef.org/georgia/media/3436/file/oecd\\_report\\_en.pdf](http://www.unicef.org/georgia/media/3436/file/oecd_report_en.pdf).

<sup>153</sup> [www.oecd-ilibrary.org/sites/bbc437ae-en/index.html?itemId=/content/component/bbc437ae-en](http://www.oecd-ilibrary.org/sites/bbc437ae-en/index.html?itemId=/content/component/bbc437ae-en).

<sup>154</sup> [www.unicef.org/georgia/media/3436/file/oecd\\_report\\_en.pdf](http://www.unicef.org/georgia/media/3436/file/oecd_report_en.pdf).

<sup>155</sup> [www.geostat.ge/media/35057/INDICATORS-OF-SECONDARY-GENERAL-EDUCATION-SCHOOLS---2020-2021.pdf](http://www.geostat.ge/media/35057/INDICATORS-OF-SECONDARY-GENERAL-EDUCATION-SCHOOLS---2020-2021.pdf).

<sup>156</sup> [www.geostat.ge/ka/modules/categories/59/zogadi-ganatleba](http://www.geostat.ge/ka/modules/categories/59/zogadi-ganatleba).

same indicator for the previous year.<sup>157</sup> UNICEF data show that the completion rate for children of primary school age was 99.9 per cent in 2018.<sup>158</sup> However, the completion rate for young people of upper secondary age was 80.9 per cent the same year.<sup>159</sup> According to the National Statistics Office of Georgia, during the 2019-2020 school year, 8 247 students dropped out of school, which is 31.6 per cent lower than the previous year. Among those, 41 per cent were girls and 59 per cent boys.<sup>160</sup> Overall in Georgia, more than 9 300 children and adolescents are out of school.<sup>161</sup> Although the literacy rate for the 15-24 years age group in Georgia was 99.64 per cent in 2017, data show that more than half (52 per cent) of primary- and secondary-age students in Georgia do not achieve minimum proficiency in the foundational skills needed for further learning and skills development.<sup>162</sup>

The most recent data indicate that the country's public spending on education and training was 3.5 per cent of the country's GDP in 2018,<sup>163</sup> while the EU average for 2017 was 4.7 per cent.<sup>164</sup> The Georgian Government is currently planning to increase expenditure in the coming years, although how the additional funding will be allocated is still under discussion. In March 2019, the Government announced that it plans to devote about 6 per cent of the country's GDP to investing in the education system by 2022.<sup>165</sup>

Concerning broadband development in the country, ITU data show that 72.5 per cent of individuals in Georgia used the Internet in 2020.<sup>166</sup> In the same year, the number of fixed-broadband subscriptions per 100 inhabitants was 25.<sup>167</sup> ITU data also show that 75.8 per cent of households in Georgia had Internet access at home in 2019.<sup>168</sup> Wireline broadband networks (using fibre-optic or cable networks) are limited in their reach outside urban areas.<sup>169</sup> Data published by the Georgian National Communications Commission from May 2020 indicate that Tbilisi and Adjara are the regions with the highest Internet penetration in the country, while the north-western region of Abkhazia has the lowest penetration rate.<sup>170</sup>

Since 2014, fibre infrastructure has been steadily expanding in the country, while xDSL has been diminishing. In 2018, 75 per cent of total subscriptions were for FTTx technology, compared to only 31 per cent in 2010 (when xDSL accounted for 59 per cent of total subscriptions). Today,

<sup>157</sup> [www.geostat.ge/media/35057/INDICATORS-OF-SECONDARY-GENERAL-EDUCATION-SCHOOLS---2020-2021.pdf](http://www.geostat.ge/media/35057/INDICATORS-OF-SECONDARY-GENERAL-EDUCATION-SCHOOLS---2020-2021.pdf).

<sup>158</sup> [https://data.unicef.org/resources/data\\_explorer/unicef](https://data.unicef.org/resources/data_explorer/unicef).

<sup>159</sup> [https://data.unicef.org/resources/data\\_explorer/unicef\\_f/?ag=UNICEF&df=GLOBAL\\_DATAFLOW&ver=1.0&dq=GEO.ED\\_CR\\_L1+ED\\_CR\\_L3+ED\\_ANAR\\_L3+ED\\_15-24\\_LR\\_T&startPeriod=2014&endPeriod=2020](https://data.unicef.org/resources/data_explorer/unicef_f/?ag=UNICEF&df=GLOBAL_DATAFLOW&ver=1.0&dq=GEO.ED_CR_L1+ED_CR_L3+ED_ANAR_L3+ED_15-24_LR_T&startPeriod=2014&endPeriod=2020).

<sup>160</sup> [www.geostat.ge/media/35057/INDICATORS-OF-SECONDARY-GENERAL-EDUCATION-SCHOOLS---2020-2021.pdf](http://www.geostat.ge/media/35057/INDICATORS-OF-SECONDARY-GENERAL-EDUCATION-SCHOOLS---2020-2021.pdf).

<sup>161</sup> <http://data.uis.unesco.org/#> (Indicators: out-of-school children, adolescents and youth of primary and secondary school age, both sexes.)

<sup>162</sup> UNICEF calculation of the number of students in primary, lower secondary and upper secondary not achieving minimum proficiency in mathematics; data for Georgia are based on the latest available figures from UIS and OECD PISA data (<http://uis.unesco.org/en/country/ge>).

<sup>163</sup> <http://data.uis.unesco.org/#> (Indicator: government expenditure on education as a percentage of GDP.)

<sup>164</sup> <https://data.worldbank.org/indicator/SE.XPD.SECO.PC.ZS?locations=EU>.

<sup>165</sup> <https://agenda.ge/en/news/2019/645>.

<sup>166</sup> ITU World Telecommunication/ICT Indicators Database online (2021), available at <http://handle.itu.int/11.1002/pub/81550f97-en> (indicator i99H).

<sup>167</sup> ITU World Telecommunication/ICT Indicators Database online (2021), available at <http://handle.itu.int/11.1002/pub/81550f97-en> (indicator i992b).

<sup>168</sup> [www.itu.int/en/ITU-D/Statistics/Documents/statistics/2019/CoreHouseholdIndicators.xlsx](http://www.itu.int/en/ITU-D/Statistics/Documents/statistics/2019/CoreHouseholdIndicators.xlsx).

<sup>169</sup> <http://documents1.worldbank.org/curated/en/316241571855041161/pdf/Concept-Project-Information-Documents-PID-Log-In-Georgia-P169698.pdf>.

<sup>170</sup> <https://analytics.comcom.ge/en/statistics/?c=internet&f=subscribers&exp=penetrationbyregion&sid=801631>.

fibre is by far the most widely used technology in Georgia, with Wi-Fi the second most common—mostly in rural parts of Georgia where FTTx connections are not available.<sup>171</sup>

According to ITU data, in 2019 the number of active mobile-broadband subscriptions per 100 inhabitants was 81.6.<sup>172</sup> Moreover, with very low prices compared to many other regional and European countries, 2G and 3G networks covered 99.98 per cent of Georgia's population in 2020,<sup>173</sup> while 4G/LTE covered 99.7 per cent of the population in 2019.<sup>174</sup> While all of mobile network operators have been investing to expand the reach and capabilities of LTE infrastructure to areas outside Tbilisi,<sup>175</sup> MagtiCom and VEON Georgia are the operators with most mobile Internet traffic in the country.<sup>176</sup>

As a result of the significant investments made by Georgian mobile network operators to improve telecommunication infrastructure and achieve higher coverage, Internet traffic in Georgia has grown from 1.5 million GB in 2013 to 63.7 million GB in 2018.<sup>177</sup> In 2019, Georgia had 0.09 EB of mobile Internet traffic.<sup>178</sup>

The Electronic Communications Act, which is the main pillar for the telecommunication sector in the country, does not provide any specific recommendations on broadband mapping.<sup>179</sup> However, it does make it possible for the regulator, the Georgian National Communications Commission, to obtain data from operators in the field of electronic communications to fulfil its legal obligations (art. 11). Moreover, it is relevant to note that the country is in the process of implementing a new specific infrastructure-sharing law aimed at reducing the cost of deployment and promoting competition in the telecommunication sector. In April 2020, the regulator issued a resolution approving the information forms to be submitted by authorized persons and/or licence holders in the field of electronic communications for the purpose of mapping the telecommunication infrastructure on a single digital map,<sup>180</sup> which is a milestone in the broadband mapping effort started by the regulator in 2018. While substantial work is being done in the field of infrastructure mapping, service and investment plans have not yet been mapped in Georgia and could provide new avenues for future development.<sup>181</sup>

### 3.3.2 Government strategies, status of education quality, and the role of ICTs

In 2017, Georgia's Ministry of Education, Science, Culture and Sport developed the Unified Strategy for Education and Science for 2017-2021 to guide the country's education system and provide high-quality education for all. The main priorities of the Unified Strategy include

<sup>171</sup> <https://analytics.comcom.ge/en/statistics/?c=internet&f=subscribers&exp=technologies&sid=801640>.

<sup>172</sup> ITU World Telecommunication/ICT Indicators Database online (2021), available at <http://handle.itu.int/11.1002/pub/81550f97-en> (indicator i911mw).

<sup>173</sup> ITU World Telecommunication/ICT Indicators Database online (2020), available at <http://handle.itu.int/11.1002/pub/81550f97-en> (indicator i271G).

<sup>174</sup> ITU World Telecommunication/ICT Indicators Database online (2020), available at <http://handle.itu.int/11.1002/pub/81550f97-en> (indicator i271GA).

<sup>175</sup> [www.itu.int/en/ITU-D/Statistics/Documents/bigdata/Georgia.pdf](http://www.itu.int/en/ITU-D/Statistics/Documents/bigdata/Georgia.pdf).

<sup>176</sup> <https://analytics.comcom.ge/en/statistics/?c=mobiles&sid=801641&f=mobintraffics&exp=traffic>.

<sup>177</sup> For more information please consult: <https://galtandtaggart.com>.

<sup>178</sup> ITU World Telecommunication/ICT Indicators Database online (2020), available at <http://handle.itu.int/11.1002/pub/81550f97-en> (indicator i136mwi).

<sup>179</sup> <https://matsne.gov.ge/en/document/download/29620/26/en/pdf>.

<sup>180</sup> <https://matsne.gov.ge/ka/document/view/4861607?publication=0>.

<sup>181</sup> [www.itu.int/en/ITU-D/Regional-Presence/Europe/Documents/Events/2020/RRF/20-11-26%20Background%20Paper\\_Broadband%20Mapping%20Systems%20in%20Europe%20and%20Regional%20Harmonization%20Initiatives\\_final.pdf](http://www.itu.int/en/ITU-D/Regional-Presence/Europe/Documents/Events/2020/RRF/20-11-26%20Background%20Paper_Broadband%20Mapping%20Systems%20in%20Europe%20and%20Regional%20Harmonization%20Initiatives_final.pdf).



incorporating student-oriented teaching strategies, investing in the teaching workforce and creating a safe school environment.<sup>182</sup> There are five specific goals in the strategy:<sup>183</sup>

- Increase access to high-quality pre-school education and prepare children of school age for school;
- Ensure access to high-quality secondary education and educational results relevant to national and international standards in order to prepare students for future life;
- Increase the number of vocational students to support the socio-economic development of the country, and ensure their competitiveness by developing vocational and general skills;
- Internationalize higher education and ensure high-quality higher education to improve personal and professional development and employment;
- Modernize and internationalize the science, technology and innovation system for creating new knowledge and promoting the sustainable development of the country.

As identified in a recent assessment, *OECD Reviews of Evaluation and Assessment in Education: Georgia*, one challenge that Georgia faces in terms of the strategy's implementation and monitoring is that fact that, despite being the highest-level strategic document of the education sector, the Unified Strategy is not regarded by stakeholders as a definitive point of reference. Many teachers and principals have not seen it or even heard of it. High-level initiatives are frequently introduced, sometimes at odds with the Unified Strategy and often without sufficient documentation.<sup>184</sup>

Furthermore, according to OECD PISA results for 2018,<sup>185</sup> Georgian students' scores for reading, mathematics and science were lower than the OECD average.<sup>186</sup> PISA 2018 results in Georgia were significantly below those observed in 2015 in reading and science,<sup>187</sup> reversing most of the gains observed between 2010 and 2015.<sup>188</sup> Only mathematics results in PISA 2018 remained significantly above the level observed in 2010.<sup>189</sup> In particular in the context of socio-economically disadvantaged schools, Georgia has one of the largest percentages of low performers in reading among socio-economically advantaged and disadvantaged students. Even among the top performers, Georgia is among the participating countries with the lowest scores.<sup>190</sup> PISA 2015 data confirm that Georgian schools have high levels of autonomy compared to those in OECD countries. In 2018, PISA data also showed that only a small share of students attended schools whose principal reported that the school's capacity to provide instruction was hindered greatly or to some extent by a lack of teaching staff.<sup>191</sup>

<sup>182</sup> <https://planipolis.iiep.unesco.org/en/2017/unified-strategy-education-and-science-2017-2021-6503>.

<sup>183</sup> [www.mes.gov.ge/uploads/files/Unified%20Strategy%20of%20Education%20and%20Science%202017-2021.docx](http://www.mes.gov.ge/uploads/files/Unified%20Strategy%20of%20Education%20and%20Science%202017-2021.docx).

<sup>184</sup> [www.oecd-ilibrary.org/sites/bbc437ae-en/index.html?itemId=/content/component/bbc437ae-en](http://www.oecd-ilibrary.org/sites/bbc437ae-en/index.html?itemId=/content/component/bbc437ae-en).

<sup>185</sup> PISA tests the reading, mathematics and science performance of 15-year-old pupils across the world every three years. In the context of the EU, PISA results are particularly important because they feed into the Education and Training 2020 strategic cooperation framework (ET2020). They form the basis for one of the ET2020 benchmarks: the rate of underachievers in reading, mathematics or science among 15-year-olds in the EU should be less than 15 per cent by 2020. Underachievers in PISA are those pupils who fail to reach the minimum proficiency level necessary to participate successfully in society. More information on the PISA indicators and ET2020 is available at [https://ec.europa.eu/education/sites/education/files/document-library-docs/pisa-2018-eu\\_1.pdf](https://ec.europa.eu/education/sites/education/files/document-library-docs/pisa-2018-eu_1.pdf).

<sup>186</sup> [www.oecd.org/pisa/publications/PISA2018\\_CN\\_GEO.pdf](http://www.oecd.org/pisa/publications/PISA2018_CN_GEO.pdf).

<sup>187</sup> <https://agenda.ge/en/news/2019/3295>.

<sup>188</sup> [www.unicef.org/georgia/press-releases/oecd-report-learning-outcomes-students-georgia-are-improving-however-equity-remains](http://www.unicef.org/georgia/press-releases/oecd-report-learning-outcomes-students-georgia-are-improving-however-equity-remains).

<sup>189</sup> [www.oecd.org/pisa/publications/PISA2018\\_CN\\_GEO.pdf](http://www.oecd.org/pisa/publications/PISA2018_CN_GEO.pdf).

<sup>190</sup> <https://gpseducation.oecd.org/CountryProfile?primaryCountry=GEO&treshold=10&topic=PI>.

<sup>191</sup> <https://gpseducation.oecd.org/CountryProfile?primaryCountry=GEO&treshold=10&topic=PI>.

PISA data also suggest significant gaps dependent upon geographical location within Georgia. For instance, students from rural areas scored below their peers in cities, equivalent to nearly a 1.5-year gap in schooling. Additionally, outcome gaps observable in Georgia in PISA 2015 have widened since PISA 2009. In 2009, students from cities scored 30 points more than students from rural areas. By 2015, this gap had increased to 44 points. The difference in science scores between students who spoke mainly Georgian at home and those who spoke mainly another language at home had also widened from 40 points to 60 points, equivalent to almost two years of schooling.<sup>192</sup>

For general education in the country, teaching follows the national curriculum developed by the National Curriculum Department of the Ministry of Education, Science, Culture and Sport. The first national curriculum was launched in 2005, establishing key desired learning outcomes and the distribution of instruction hours for all subjects and grades.<sup>193</sup> Changes implemented in the 2011 and 2018 versions of the curriculum emphasized a more holistic approach to learning, focusing on developing student competencies and social and emotional skills, rather than on memorizing facts.<sup>194</sup> Alongside the updated curriculum, new textbooks were developed and published.<sup>195</sup>

Moreover, one of the relevant actions in the area of evaluation, assessment and improving education quality in the Unified Strategy for 2017-2021 was updating the national curriculum for primary and secondary education. As a result, 2018 reforms introduced a stage-based approach, whereby learning outcomes for students are organized around learning stages, rather than grades. While such changes offer teachers greater flexibility to adapt instruction to different levels of student learning, they also raise questions about whether teachers are trained to use such an advanced curriculum.<sup>196</sup> To address these challenges and other barriers to high-quality education, the Ministry of Education, Science, Culture and Sport is currently revising and updating its national education policy.

In terms of school infrastructure, major government-led projects have been implemented to improve the country's educational facilities so that institutions comply with modern instructional standards at all levels of education. These initiatives have been carried out within the framework of a nationwide project entitled "Iakob Gogebashvili - Rehabilitation of Public Schools in Georgia".<sup>197</sup> Furthermore, there have also been activities relating to the development of small-scale schools in rural areas, as well as the provision of modern technologies for learning.<sup>198</sup> Data from the Georgian Statistical Office for 2010 show that there were some 29 084 computers installed in schools throughout the country, which meant that about 93.5 per cent of schools had computers available to students.<sup>199</sup> However, no recent data are available in the public domain.

In terms of school mapping and collecting data on the educational system, in 2012 the Government passed an act, under the Ministry of Education, Science, Culture and Sport, setting out the details for an overhaul of the national EMIS. Until that point, the EMIS had been a

<sup>192</sup> [www.oecd-ilibrary.org/sites/bbc437ae-en/index.html?itemId=/content/component/bbc437ae-en](http://www.oecd-ilibrary.org/sites/bbc437ae-en/index.html?itemId=/content/component/bbc437ae-en).

<sup>193</sup> Ministry of Education and Science, "Georgia Country Background Report" (Tbilisi, 2018).

<sup>194</sup> Ministry of Education and Science Order No. 40/N of 18 May 2016, approving the new national curriculum.

<sup>195</sup> [http://planipolis.iiep.unesco.org/sites/planipolis/files/ressources/georgia\\_unified\\_strategy\\_of\\_education\\_and\\_science\\_2017-2021\\_0.pdf](http://planipolis.iiep.unesco.org/sites/planipolis/files/ressources/georgia_unified_strategy_of_education_and_science_2017-2021_0.pdf).

<sup>196</sup> [www.oecd-ilibrary.org/sites/bbc437ae-en/index.html?itemId=/content/component/bbc437ae-en](http://www.oecd-ilibrary.org/sites/bbc437ae-en/index.html?itemId=/content/component/bbc437ae-en).

<sup>197</sup> [www.unicef.org/georgia/media/1946/file/basic%20education%20PISA.pdf](http://www.unicef.org/georgia/media/1946/file/basic%20education%20PISA.pdf).

<sup>198</sup> [http://planipolis.iiep.unesco.org/sites/planipolis/files/ressources/georgia\\_unified\\_strategy\\_of\\_education\\_and\\_science\\_2017-2021\\_0.pdf](http://planipolis.iiep.unesco.org/sites/planipolis/files/ressources/georgia_unified_strategy_of_education_and_science_2017-2021_0.pdf).

<sup>199</sup> [www.geostat.ge/en/modules/categories/59/general-education](http://www.geostat.ge/en/modules/categories/59/general-education).

structural unit of the Ministry and played an important role in the introduction of modern IT in the education field.<sup>200</sup> An OECD-led assessment has characterized Georgia's information systems for education as modern, widely used and highly trusted.

While the EMIS collects data from all schools throughout the country, the National Assessment and Examinations Centre is the government body responsible for storing assessment data and reviewing it for students and teachers. This configuration has limitations, as the two bodies mostly work with their own data and neither is responsible for evaluating the system as a whole. Moreover, accessing the information, especially in an analytical manner, remains a challenge in the country.<sup>201</sup>

Despite these limitations, Georgia's Ministry of Education, Science, Culture and Sport has a designated space on its website with a map illustrating current infrastructure projects across the country,<sup>202</sup> as well as an "e-Catalog" portal, which is an electronic catalogue of educational institutions containing complete information about public schools offering general education. This system allows the user to retrieve information about each institution's infrastructure, learning processes, teaching, teachers and student achievements.<sup>203</sup> The layers for mapping projects include: (i) educational resource centres; (ii) newly built schools; (iii) construction under way; (iv) Tbilisi public schools; (v) the Millennium Challenge Account Georgia Millennium programme; and (vi) partially refurbished public schools.<sup>204</sup> Each data point on the map includes the following information:<sup>205</sup>

- Name of the school;
- Region;
- District;
- School address;
- Identification code;
- School phone number;
- E-mail address;
- Level of instruction;
- Data on student and teacher numbers;
- School building size;
- Yard area;
- Classrooms/sport fields/gym; and
- Information on infrastructure adaptations for people with disabilities.

By December 2020, this interactive map with information on school-related infrastructure had been viewed about 150 000 times. In addition to this interactive map of infrastructure projects, statistical data on the country's education system is available on the National Statistics Office of Georgia website for each of the main levels of education, with numbers of students, schools by type, region, grade and age, and data on teachers and infrastructure, such as the number

<sup>200</sup> [www.mes.gov.ge/content.php?id=3799&lang=eng#:~:text=Education%20Management%20Information%20System%20\(EMIS\)%20is%20a%20newly%20established%20legal,Education%20and%20Science%20of%20Georgia.&text=In%202011%2C%20EMIS%20administered%20the,Internet%2C%20new%20computers%20and%20servers.](http://www.mes.gov.ge/content.php?id=3799&lang=eng#:~:text=Education%20Management%20Information%20System%20(EMIS)%20is%20a%20newly%20established%20legal,Education%20and%20Science%20of%20Georgia.&text=In%202011%2C%20EMIS%20administered%20the,Internet%2C%20new%20computers%20and%20servers.)

<sup>201</sup> [www.unicef.org/georgia/media/3436/file/oeed\\_report\\_en.pdf](http://www.unicef.org/georgia/media/3436/file/oeed_report_en.pdf).

<sup>202</sup> <http://mes.gov.ge/>.

<sup>203</sup> <https://catalog.emis.ge/main>.

<sup>204</sup> [www.google.com/maps/d/u/0/viewer?mid=1YCxOWkO-44uq5TkqM9QAla0yboc&ll=44.70600988486242%2C45.285711658537124&z=6](https://www.google.com/maps/d/u/0/viewer?mid=1YCxOWkO-44uq5TkqM9QAla0yboc&ll=44.70600988486242%2C45.285711658537124&z=6).

<sup>205</sup> [www.google.com/maps/d/u/0/viewer?mid=1YCxOWkO-44uq5TkqM9QAla0yboc](https://www.google.com/maps/d/u/0/viewer?mid=1YCxOWkO-44uq5TkqM9QAla0yboc).

of computers.<sup>206</sup> Despite the wide variety of indicators, some of the ICT-related data points are outdated, with the latest indicators being from the 2009-2010 period.<sup>207</sup>

With regard to the role of ICTs, the OECD reports that, in 2015, Georgia had 0.3 computers per student, less than half of the OECD average (0.77). This amounts to a total estimated number of PCs of 170 000.<sup>208</sup> In terms of connectivity, according to a 2020 report by Georgia's Institute for the Development of Freedom of Information, there are about 78 000 vulnerable students in Georgia who do not have access to the Internet, 95 per cent of whom live in an area that may have coverage but lack the financial viability to afford it.<sup>209</sup> In the context of COVID-19, a 2020 joint report by UNICEF and ITU has shown that 15 per cent of school-age children in Georgia do not have an Internet connection in their homes.<sup>210</sup> Furthermore, Georgia's EMIS suggests that 20 per cent of children in Georgia have access to neither computers nor the Internet, significantly limiting their exercise of the right to education. In addition to unequal access to ICTs and reliable connectivity, there is also a discrepancy in terms of geographical location. Rural areas are likely to be home to students with lower household incomes, which has a direct link to students' academic performance, as students in urban areas outperform those living in rural settings.<sup>211</sup> As financial pressures mount for many families during the COVID-19 pandemic, these disparities are likely to worsen.<sup>212</sup>

### 3.3.3 Multistakeholder partnerships and financing mechanisms fostering investment in school connectivity

Starting in 2011, the EMIS started to supervise the process of providing computers, servers and Internet access at all public schools in Georgia.<sup>213</sup> The EMIS connects schools in Georgia through two main providers: MagtiCom<sup>214</sup> and Delta Com. MagtiCom, for example, signed a contract with the Ministry of Education, Science, Culture and Sport to connect 2 000 public schools (including schools in rural and high mountain areas) to the Internet by the end of 2011.<sup>215</sup>

As of 2014, Delta Com had connected some 553 public schools via optical channels, with connection speeds of up to 50 Mbit/s. MagtiCom, on the other hand, had connected 1 512 public schools with EVDO technology and 19 public schools via satellite. The speed involved with MagtiCom was up to 256 kbit/s for 632 schools; up to 512 kbit/s for 737 schools; up to 1 Mbit/s for 162 schools; and up to 50 Mbit/s for the remaining 553 schools (Delta Com).<sup>216</sup> The amount paid annually from Georgia's national budget is about EUR 1.1 million (GEL 4 397 269).<sup>217</sup>

<sup>206</sup> [www.geostat.ge/en/modules/categories/193/education](http://www.geostat.ge/en/modules/categories/193/education).

<sup>207</sup> <https://geostat.ge/media/35088/Availability-of-computers-in-Schools.xls>.

<sup>208</sup> [https://gpseducation.oecd.org/IndicatorExplorer?plotter=h5&query=34&indicators=N051\\*N055\\*N160\\*S016\\*S017\\*S018\\*N052\\*N056\\*N057\\*R001\\*R005\\*N037\\*N038\\*N039\\*N040\\*N041\\*N042\\*T012\\*T013\\*C076\\*P005\\*P006\\*N050\\*T037\\*A256\\*A258\\*A263\\*A264\\*A265\\*P819\\*N122\\*N123\\*N236\\*N237\\*N238\\*N239](https://gpseducation.oecd.org/IndicatorExplorer?plotter=h5&query=34&indicators=N051*N055*N160*S016*S017*S018*N052*N056*N057*R001*R005*N037*N038*N039*N040*N041*N042*T012*T013*C076*P005*P006*N050*T037*A256*A258*A263*A264*A265*P819*N122*N123*N236*N237*N238*N239).

<sup>209</sup> [https://idfi.ge/ge/Internet\\_access\\_and\\_use\\_in\\_georgia](https://idfi.ge/ge/Internet_access_and_use_in_georgia).

<sup>210</sup> [www.unicef.org/georgia/press-releases/15-cent-georgias-school-age-children-have-no-Internet-access-home-new-unicef-itu](http://www.unicef.org/georgia/press-releases/15-cent-georgias-school-age-children-have-no-Internet-access-home-new-unicef-itu).

<sup>211</sup> [www.unicef.org/georgia/media/3431/file/oecd\\_report\\_ge.pdf](http://www.unicef.org/georgia/media/3431/file/oecd_report_ge.pdf).

<sup>212</sup> [www.unicef.org/coronavirus/georgia-covid-19-threatens-widen-education-gap](http://www.unicef.org/coronavirus/georgia-covid-19-threatens-widen-education-gap).

<sup>213</sup> [www.mes.gov.ge/content.php?id=3799&lang=eng](http://www.mes.gov.ge/content.php?id=3799&lang=eng).

<sup>214</sup> [https://docs.google.com/spreadsheets/d/e/2PACX-1vRqURSCfkBf4Rk7WSINIsM6U0HIJzDI\\_jstxIA8ITHjqBRSIJ1\\_PINOngGHQKP2dbRcOz0weTmNSwFa/pubhtml](https://docs.google.com/spreadsheets/d/e/2PACX-1vRqURSCfkBf4Rk7WSINIsM6U0HIJzDI_jstxIA8ITHjqBRSIJ1_PINOngGHQKP2dbRcOz0weTmNSwFa/pubhtml).

<sup>215</sup> <https://opennet.net/research/profiles/georgia>.

<sup>216</sup> <https://caucasusoffline.wordpress.com/2014/07/18/Internet-in-georgian-schools/>.

<sup>217</sup> <https://caucasusoffline.wordpress.com/2014/07/18/Internet-in-georgian-schools/>.

In 2018, the Georgian Ministry of Education, Science, Culture and Sport announced a comprehensive reform of general education with the goal of introducing digital education to all public schools in the country. The main objectives of the programme included: (i) implementing more diverse digital initiatives in public schools; (ii) guaranteeing continued, high-quality education to all students; and (iii) boosting student creativity by making learning fun, exciting and engaging.<sup>218</sup> In partnership with Microsoft and the country's EMIS, the Government managed to equip computers with software such as Microsoft 365 to digitally revamp its educational environment. The partnership also included a series of training workshops designed for teachers in the country.<sup>219</sup>

More recently, Georgia's National Broadband Network Development Strategy for 2020-2025<sup>220</sup> has mandated that schools, highways and public facilities must be provided with Internet access at a download speed of 1 Gbit/s by 2025, aligned with both EU plans and plans for 5G development in the country.<sup>221</sup> The strategy aims not only to create infrastructure, but also to establish Georgia as a digital and information hub in the region between Europe and Asia, while also upgrading knowledge and skills, leading to employment growth.<sup>222</sup>

Although not directly related to school connectivity, the World Bank is currently working in the development of broadband through the Log-in Georgia project, a EUR 32.7 million support package<sup>223</sup> with the goal of expanding access to affordable broadband in rural settlements and of supporting the development of Georgia's digital economy.<sup>224</sup> The three major project outcomes intended to be: (i) increasing access to affordable broadband Internet; (ii) promoting the use of broadband-enabled digital services; and (iii) supporting project implementation.<sup>225</sup> The project expects to connect up to 1 000 villages, including settlements in mountainous regions, to high-quality and affordable broadband services. Nearly 500 000 people, residing in locations currently unserved by high-quality broadband services, stand to benefit from deployment of the broadband infrastructure envisaged by the Log-in Georgia project.<sup>226</sup> This project is likely to have a positive impact on school connectivity in rural settlements.

Building upon previous initiatives such as Educare Georgia,<sup>227</sup> other projects related to providing computers and Internet access to vulnerable communities<sup>228</sup> have also been carried out by GiveInternet.org, a social start-up that became a local partner in Georgia for the Alliance for Affordable Internet.<sup>229</sup> As of 2019, more than 300 underprivileged families have benefited. The majority of the beneficiaries are refugees living in rural areas, as well as communities living in

<sup>218</sup> [https://ms-f7-sites-01-cdn.azureedge.net/docs/stories/836788-ministry-emis-national-government-azure-en-georgia/resources/0063b436-199d-4f3e-bf4b-a20148f25674/ministry\\_of\\_education-science\\_culture\\_and\\_sport\\_of\\_georgia\\_with\\_emis\\_summary\\_slide](https://ms-f7-sites-01-cdn.azureedge.net/docs/stories/836788-ministry-emis-national-government-azure-en-georgia/resources/0063b436-199d-4f3e-bf4b-a20148f25674/ministry_of_education-science_culture_and_sport_of_georgia_with_emis_summary_slide).

<sup>219</sup> <https://customers.microsoft.com/en-us/story/836788-ministry-emis-national-government-azure-en-georgia>.  
<sup>220</sup> [www.economy.ge/uploads/files/2017/legislation/sainformacio\\_teqnologiebi/fartozolovani\\_qselebis\\_ganvitarebis\\_strategia\\_da\\_misi\\_ganxorcielebis\\_gegma.pdf](http://www.economy.ge/uploads/files/2017/legislation/sainformacio_teqnologiebi/fartozolovani_qselebis_ganvitarebis_strategia_da_misi_ganxorcielebis_gegma.pdf).

<sup>221</sup> <https://comcom.ge/uploads/other/3/3939.pdf>.

<sup>222</sup> <https://eufordigital.eu/georgia-approves-broadband-development-strategy-2020-2025/>.

<sup>223</sup> [www.worldbank.org/en/news/press-release/2020/08/28/1000-villages-to-get-better-internet-connectivity-as-part-of-world-bank-support-to-georgia-digital-transformation](http://www.worldbank.org/en/news/press-release/2020/08/28/1000-villages-to-get-better-internet-connectivity-as-part-of-world-bank-support-to-georgia-digital-transformation).

<sup>224</sup> [www.opennet.ge/eng/list/show/50-World-Bank-will-co-finance-the-State-Program-of-the-broadband-infrastructure-development](http://www.opennet.ge/eng/list/show/50-World-Bank-will-co-finance-the-State-Program-of-the-broadband-infrastructure-development).

<sup>225</sup> <http://documents1.worldbank.org/curated/en/316241571855041161/pdf/Concept-Project-Information-Documents-PID-Log-In-Georgia-P169698.pdf>.

<sup>226</sup> [www.worldbank.org/en/news/press-release/2020/08/28/1000-villages-to-get-better-internet-connectivity-as-part-of-world-bank-support-to-georgia-digital-transformation](http://www.worldbank.org/en/news/press-release/2020/08/28/1000-villages-to-get-better-internet-connectivity-as-part-of-world-bank-support-to-georgia-digital-transformation).

<sup>227</sup> [www.educaregeorgia.org/](http://www.educaregeorgia.org/).

<sup>228</sup> [https://mcusercontent.com/6a688f315888c9bb1b8512910/files/0f91d139-1299-4e32-9c52-f66a2587c00d/2019\\_Report\\_Charte.ge\\_1\\_01.pdf](https://mcusercontent.com/6a688f315888c9bb1b8512910/files/0f91d139-1299-4e32-9c52-f66a2587c00d/2019_Report_Charte.ge_1_01.pdf).

<sup>229</sup> <https://forbes.ge/news/6009/Closing-the-digital-divide-online>.

settlements for internally displaced people.<sup>230</sup> Funding for the purchase of laptops comes from private stakeholders such as Ernst & Young, the Bank of Georgia, KPMG, Huawei, TBC Insurance and individual donors. Some of the donors also sponsored Internet fees.<sup>231</sup> Other effective initiatives to provide laptops to schools have been carried out by the Government with support from Intel.<sup>232</sup>

Important connectivity projects have also been undertaken by the Georgian Research and Educational Networking Association (GRENA), such as the 2003 Networking Infrastructure Grant, “Secondary School Internet Connectivity in Georgia”, and the 2004 Information Programme Grant, “Expansion of GRENA Network to Rustavi and Setup of Computer Classes with Internet Connectivity for 5 Secondary Schools”.

Moreover, partnerships with private stakeholders such as UGT, Green Systems and Orient Logic are under way for the provision of IT-related equipment in schools. In 2019 alone, these stakeholders provided 220 schools with local wireless (Wi-Fi) connections throughout Georgia. Public-private partnership has enabled the installation of software on public elementary school laptops and the maintenance of computers when needed.<sup>233</sup>

In 2018, the Ministry of Education, Science, Culture and Sport identified wireless Internet as a viable option for Internet access in Georgian schools. The Government authorized the International Education Center, which operates in the Ministry’s sphere of governance, to purchase wireless Internet infrastructure for public schools. Initially, the Center was to provide 69 public schools with wireless Internet, most of which are located in the following areas: Akhaltsikhe, Samtredia, Poti, Martvili, Sachkhere, Tsageri, Tskaltubo, Tianeti, Adigeni, Bolnisi, Akhmeta, Kazbegi, Lanchkhuti, Chokhatauri and Ozurgeti. Based on the results of market research, the amount of financial resources required was estimated at EUR 435 091 (GEL 1 740 000).<sup>234</sup>

### 3.3.4 National responses to COVID-19 and educational initiatives for distance learning

About 661 500 children were directly affected by the closure of schools as of 21 March 2020 owing to COVID-19. The state of emergency ended on 23 May; however, some restrictions remained in place. Some schools reopened in September 2020, but distance learning will continue.<sup>235</sup> Importantly, Georgia has experienced multiple transitions between fully face-to-face and full or partial distance learning since the spring of 2020.

In response to the transition to distance learning, the Ministry of Education, Science, Culture and Sport, supported by UNICEF in partnership with the Georgian Coalition for Education for All, developed guidelines for teachers and schools to plan and implement online learning programmes, including training for primary school teachers, and to develop online learning resources in various subjects, reaching an estimated 414 000 students.<sup>236</sup>

<sup>230</sup> [www.ffwd.org/tech-nonprofits/s/giveInternet-org/#:~:text=GiveInternet.org%20is%20a%20nonprofit,and%20rural%20areas%20of%20Georgia](http://www.ffwd.org/tech-nonprofits/s/giveInternet-org/#:~:text=GiveInternet.org%20is%20a%20nonprofit,and%20rural%20areas%20of%20Georgia).

<sup>231</sup> <https://charte.ge/en/projects>.

<sup>232</sup> <http://buki.ge/about.html>.

<sup>233</sup> <https://emis.ge/news/1967/>.

<sup>234</sup> <https://mes.gov.ge/content.php?id=8638&lang=geo>.

<sup>235</sup> <https://agenda.ge/en/news/2020/1283>.

<sup>236</sup> [www.unicef.org/media/93756/file/ECAR%20COVID-19%20Situation%20Report%20No.%2016%20End%20of%20year%202020.pdf](http://www.unicef.org/media/93756/file/ECAR%20COVID-19%20Situation%20Report%20No.%2016%20End%20of%20year%202020.pdf).

Not all children, however, could be reached with online learning. To enable more comprehensive and inclusive learning continuity for those without devices or connectivity, the Ministry and Georgia's First Channel, 1TV, launched a project called Teleskola in March 2020.<sup>237</sup> The project's main goal is to provide educational content for students of all grades and in different subjects across the country's schools via television, allowing students without access to the Internet to access content for learning purposes nevertheless.<sup>238</sup> The Ministry prepared a table of lessons in accordance with the national curriculum. Televised lessons are conducted by experienced teachers in various subjects, covering both Georgian and non-Georgian (Armenian, Azerbaijani) affairs and taking into account the interests of ethnic minorities. The lessons have been provided with sign language and in-depth translation, and filming has been occurring since the start of the pandemic—both in the studio and in outdoor locations, depending on the specifics of the subject.<sup>239</sup> UNICEF, in partnership with Georgian Coalition for Education for All, has supported these lessons.

The Government has signalled that Teleskola will remain a long-term project and will continue even after the threat of coronavirus has been overcome. Moreover, within the scope of the project, Georgia's Second Channel, 2TV, will be gradually transformed into an educational platform called First Channel–Education, which will translate and showcase the world's best educational programmes in the future.<sup>240</sup>

In May 2020, a Memorandum of Cooperation was signed by the Ministry of Education, Science, Culture and Sport, UNICEF, the Georgian Coalition for Education for All and the EMIS, with support from UK Aid, to cooperate in the field of education in times of COVID-19. A project called iSchool<sup>241</sup> was created with the goal of simplifying the teaching process, providing support for the fundamentals in education, helping with the development of creative thinking, and increasing motivation among teachers and students. As a not-for-profit project, the initiative aims to popularize the use of online learning and electronic materials so that anyone across Georgia can access the educational resources they need in one place.<sup>242</sup> Students can download assignments and complete them independently, as well as becoming familiar with the necessary materials. Teaching materials are also available for teachers.<sup>243</sup>

Around the same time, another Memorandum of Cooperation was signed by the Khan Academy, a leading non-formal education platform for adolescents, and UNICEF Georgia. The partnership aims to build the resilience of adolescents in coping with challenges—especially needs emerging during the COVID-19 pandemic—and will focus on improving their knowledge-base and transferrable skills, as well as promoting a healthy lifestyle.<sup>244</sup> In addition, more than 40 online events will be organized with the aim of establishing online networks among adolescents, enabling them to discuss their concerns and share their experiences. The partnership includes organizing online training for young people and support for peer-to-peer education.<sup>245</sup>

<sup>237</sup> <http://mes.gov.ge/content.php?id=10248&lang=eng>.

<sup>238</sup> <https://agenda.ge/en/news/2020/1052>.

<sup>239</sup> [www.el.ge/projects/teleskola](http://www.el.ge/projects/teleskola).

<sup>240</sup> <http://mes.gov.ge/content.php?id=10248&lang=eng>.

<sup>241</sup> [www.el.ge/projects/iskola](http://www.el.ge/projects/iskola).

<sup>242</sup> [www.el.ge/about-us](http://www.el.ge/about-us).

<sup>243</sup> [www.el.ge/projects/iskola](http://www.el.ge/projects/iskola).

<sup>244</sup> [www.unicef.org/georgia/press-releases/new-partnership-initiative-support-young-people-during-covid-19-launched-georgia](http://www.unicef.org/georgia/press-releases/new-partnership-initiative-support-young-people-during-covid-19-launched-georgia).

<sup>245</sup> [www.unicef.org/georgia/press-releases/new-partnership-initiative-support-young-people-during-covid-19-launched-georgia](http://www.unicef.org/georgia/press-releases/new-partnership-initiative-support-young-people-during-covid-19-launched-georgia).

In response to increasing demands on the education system, Georgia reported that it was recruiting new teachers for school reopening.<sup>246</sup> In September 2020, the Ministry of Education, Science, Culture and Sport established a partnership with the Estonian Embassy and UNICEF to launch a programme to support educators (e.g. teachers and school administrators) with distance learning at 100 schools throughout Georgia, including remote and mountainous areas.<sup>247</sup> The focus for elementary school teachers was on competency-based teaching and learning methodology, while school administrators were trained in educational environments and school management. Along with online training, UNICEF has noted government efforts in Georgia to provide psychosocial and mental health support for teachers.<sup>248</sup>

Other initiatives have been carried out by United Nations agencies and other development partners in advocating for improved access to computers and the Internet for the most vulnerable children to enable equal participation in continued learning.<sup>249</sup> A UNICEF report has shown that children and young people from the poorest households (i.e. rural and lower-income communities) in Georgia are falling even further behind their peers in the educational sphere and are left with very little opportunity ever to catch up.<sup>250</sup> As a result, UNICEF, in partnership with the Georgian Coalition for Education for All and the Ministry of Education, Science, Culture and Sport, is developing teaching and learning resources for effective distance/online learning. It has also been developing an education platform to support distance learning in Abkhazia.<sup>251</sup> Additionally, the Ministry has created Microsoft Office 365 user profiles for about 600 000 students at Georgian public schools and up to 55 000 teachers and other staff through the EMIS. A portal has been created that allows students and their parents to access students' data without the direct involvement of the school administration or teachers.<sup>252</sup>

To support continued access to education, UNICEF has also delivered entertainment and educational materials for kindergartens and a youth centre, as well as computers, projectors and network devices for schools in Pankisi Gorge. With UNICEF support, in partnership with the CK-12 Foundation,<sup>253</sup> the Georgian Coalition for Education for All is translating and adapting interactive online teaching and learning resources for students and teachers in Georgia.<sup>254</sup> The adapted content and learning resources have also been made available on the Ministry's designated the electronic resources portal.<sup>255</sup> UNICEF has supported parents and caregivers to engage in and support their children's distance learning, including outreach to the most vulnerable children, who are unlikely to return to school, among its efforts to support learning continuity, whether face-to-face or at a distance.

<sup>246</sup> <http://tcg.uis.unesco.org/survey-education-covid-school-closures/>.

<sup>247</sup> [www.finchannel.com/world/georgia/78948-educators-improve-distance-learning-techniques-as-a-result-of-the-partnership-among-georgia-estonia-and-unicef](http://www.finchannel.com/world/georgia/78948-educators-improve-distance-learning-techniques-as-a-result-of-the-partnership-among-georgia-estonia-and-unicef).

<sup>248</sup> UNICEF COVID-19 response in education questionnaire, September 2020.

<sup>249</sup> [www.unicef.org/media/81731/file/Georgia-COVID19-SitRep-8-May-2020.pdf](http://www.unicef.org/media/81731/file/Georgia-COVID19-SitRep-8-May-2020.pdf).

<sup>250</sup> [www.unicef.org/georgia/press-releases/15-cent-georgias-school-age-children-have-no-internet-access-home-new-unicef-itu](http://www.unicef.org/georgia/press-releases/15-cent-georgias-school-age-children-have-no-internet-access-home-new-unicef-itu).

<sup>251</sup> [www.unicef.org/media/81731/file/Georgia-COVID19-SitRep-8-May-2020.pdf](http://www.unicef.org/media/81731/file/Georgia-COVID19-SitRep-8-May-2020.pdf).

<sup>252</sup> [https://globaled.gse.harvard.edu/files/geii/files/framework\\_guide\\_v2.pdf](https://globaled.gse.harvard.edu/files/geii/files/framework_guide_v2.pdf).

<sup>253</sup> [www.ck12.org/student/](http://www.ck12.org/student/).

<sup>254</sup> [www.unicef.org/media/84016/file/Georgia-COVID-19-SitRep-9-October-2020.pdf](http://www.unicef.org/media/84016/file/Georgia-COVID-19-SitRep-9-October-2020.pdf).

<sup>255</sup> [www.el.ge/](http://www.el.ge/).



## 3.4 Moldova

### 3.4.1 Overview of the education system and status of broadband

The Government of the Republic of Moldova identifies education as a national priority and recognizes the role of education in building a knowledge-based society. According to Article 35 of the country's Constitution, the right to education is a fundamental right of every citizen.<sup>256</sup> As such, access to education is equal, free and merit-based, and state education is free and secular. The national education sector has been regulated by the Education Code since 2014.<sup>257</sup> In terms of the organization of the education system, pre-school education is for children up to the age of six. Primary education covers grades 1 to 4 and typically involves children between the ages of 7 and 10. Secondary education consists of two tracks: general and vocational. General secondary education, cycle I, covering grades 5 to 9, is called *gimnaziul* (gymnasium); cycle II, covering grades 10 to 12, is known as *liceul* (lyceum).<sup>258</sup> In other words, compulsory education lasts nine years, from age 7 to age 16.<sup>259</sup>

Since 2014, reforms have been under way, with EU support, to help the country transform and modernize its education sector according to labour market needs and European standards. The country's challenges with regard to strengthening the network of general education institutions, enhancing the autonomy and accountability of educational institutions, implementing performance-based funding mechanisms, modernizing curricula, institutionalizing external evaluations, and revamping initial and in-service training for teachers and managerial staff all remain critical areas for future policy.<sup>260</sup>

In the 2020-2021 year, Moldova had 1 241 registered education institutions: 106 primary schools, 787 lower secondary schools (*gimnaziul*), 336 upper secondary schools (high school/*liceul*), two evening high schools, and 10 schools for children with intellectual and physical disabilities.<sup>261</sup> Of the total number of educational institutions, the vast majority are public; all private educational institutions are located in cities.<sup>262</sup> In 2019, according to UIS data, there were some 363 760 students enrolled in primary and general secondary education in Moldova.<sup>263</sup> Of these, 139 612 students were enrolled in primary education<sup>264</sup> and 224 148 in secondary education.<sup>265</sup> The totals differ slightly according to a study carried out in 2020-2021 by the National Bureau of Statistics of the Republic of Moldova, which indicated a total of 334 375 students: 11 243 enrolled in primary education, 124 534 in *gimnaziul*, 197 038 in *liceul*, 1 019 in evening high school, and 541 in schools for students with special learning needs. In 2019, the total number of out-of-school children and adolescents in the Republic of Moldova exceeded 70 800,<sup>266</sup> the majority of whom were of lower and upper secondary school age. In fact, according to available data,

<sup>256</sup> Constitution of the Republic of Moldova of 29 July 1994 (see Official Gazette No. 1 of 12 August 1994, available at <http://goo.gl/DB1eJ2>).

<sup>257</sup> Education Code of the Republic of Moldova of 17 July 2014 (see Official Gazette No. 319-324 of 24 October 2014, Art. No. 634).

<sup>258</sup> <https://education.stateuniversity.com/pages/993/Moldova-EDUCATIONAL-SYSTEM-OVERVIEW.html>.

<sup>259</sup> <http://uis.unesco.org/en/country/md>.

<sup>260</sup> [www.lymec.eu/2017/10/04/education-system-in-moldova/](http://www.lymec.eu/2017/10/04/education-system-in-moldova/).

<sup>261</sup> Information from the National Bureau of Statistics provided by the Ministry of Economy and Infrastructure.

<sup>262</sup> <https://diez.md/2020/01/04/doc-cate-scoli-avem-in-fiecare-raion-din-tara-si-cati-elevi-inregistreaza-moldova-in-anul-2020/>.

<sup>263</sup> <http://data.uis.unesco.org/#>.

<sup>264</sup> <http://data.uis.unesco.org/#> (indicator: enrolment in primary education, both sexes).

<sup>265</sup> <http://data.uis.unesco.org/#> (indicator: enrolment in secondary education, both sexes).

<sup>266</sup> <http://data.uis.unesco.org/#>.

Moldova's out-of-school rates for children of lower secondary age (15.5 per cent) and upper secondary age (35.3 per cent) are the highest among the nine countries included in this study.<sup>267</sup>

In terms of quality, UNESCO data show that the literacy rate for the 15-24 years age group in Moldova was 99.8 per cent in 2014.<sup>268</sup> However, UNICEF calculations using the latest available data from UIS and OECD show that 44.2 per cent of children and adolescents do not achieve minimum proficiency in the foundational skills needed for further learning and skills development.<sup>269</sup> According to the Ministry of Economy and Infrastructure, it is important to note that this number may not fully capture the complexity of the education situation in the country, given that many families go to work abroad. Despite such children continuing their education abroad, they are taken into account in the statistics for Moldova. According to data from the Ministry of Education, Culture and Research from November 2020, for example, 56 students dropped out of school for more than a year; 17 students dropped out of school at the beginning of the pandemic period (March 2020); and 114 students dropped out of school at the beginning of the 2020-2021 academic year. Such disparities in data suggest a need to clarify the methodologies adopted and ensure consistency between national and international data.

In 2019, overall government expenditure on education as a percentage of GDP stood at 6.11 per cent.<sup>270</sup> In 2018, the country's expenditure per student in secondary education was 5.4 per cent of per capita GDP, while the EU average for 2017 was 4.7 per cent.<sup>271</sup> In the context of the COVID-19 pandemic, the issues of children out of school, dropouts and absenteeism demand even more attention than before. During the 2018-2019 school year alone, 10 per cent of primary-age children and 15 per cent of lower secondary-age children were out of school. According to UNESCO numbers, this indicates that 16 045 children and 28 863 adolescents of lower secondary age were out of school in Moldova in 2019.<sup>272</sup>

Concerning broadband development in the country, the latest official data available show that 76.1 per cent of individuals in Moldova used the Internet in 2017.<sup>273</sup> A report by the National Regulatory Agency for Electronic Communications and Information Technology (ANRCETI) highlights the fact that the country also had one of the lowest fixed-broadband costs globally in 2015.<sup>274</sup> In 2020, the number of fixed-broadband subscriptions per 100 inhabitants was 17.8,<sup>275</sup> with 94 active Internet service providers.<sup>276</sup> However, more recent data from ITU show that fixed-broadband household subscriptions in Moldova amounted to 25 per 100 inhabitants

<sup>267</sup> According to 2019 UIS data. Indicators included in calculation are: (1] out-of-school adolescents of lower secondary school age, both sexes; (2] school-age population, lower secondary education, both sexes; (3] out-of-school youth of upper secondary school age, both sexes; (4] school-age population, upper secondary education, both sexes.

<sup>268</sup> <http://uis.unesco.org/en/country/md>.

<sup>269</sup> UNICEF calculation of the number of students in primary, lower secondary and upper secondary education not achieving minimum proficiency in mathematics; data for Moldova are based on the latest available figures from UIS and PISA.

<sup>270</sup> <http://data.uis.unesco.org/#> (indicator: government expenditure on education as a percentage of GDP).

<sup>271</sup> <https://data.worldbank.org/indicator/SE.XPD.SECO.PC.ZS?locations=EU-AL>.

<sup>272</sup> <http://data.uis.unesco.org/#> (indicators: out-of-school children of primary school age, both sexes; out-of-school adolescents of lower secondary school age, both sexes).

<sup>273</sup> ITU World Telecommunication/ICT Indicators Database online (2021), available at <http://handle.itu.int/11.1002/pub/81550f97-en> (indicator i99H).

<sup>274</sup> [https://mei.gov.md/sites/default/files/2\\_avasant\\_it\\_strategic\\_roadmap.pdf](https://mei.gov.md/sites/default/files/2_avasant_it_strategic_roadmap.pdf).

<sup>275</sup> ITU World Telecommunication/ICT Indicators Database online (2021), available at <http://handle.itu.int/11.1002/pub/81550f97-en> (indicator i992b).

<sup>276</sup> [www.brodynt.com/business-Internet-connectivity-in-moldova/](http://www.brodynt.com/business-Internet-connectivity-in-moldova/).

in 2020. Assuming the average household to consist of three people, ANRCETI estimates that 75 per cent of the population enjoyed fixed-broadband access at home.<sup>277</sup>

In 2019, half of fixed Internet access subscriptions offered data access and transfer speeds between 30 and 100 Mbit/s, while 13.8 per cent gave speeds of over 100 Mbit/s.<sup>278</sup> FTTx connections increased by 14.6 per cent, reaching 451 700, while coaxial cable connections increased by 22.1 per cent to reach 54 100. FTTx technology now connects 67.37 per cent of total subscriptions,<sup>279</sup> with a significantly higher rate in Chisinau and other major cities, while xDSL technology is the most common in smaller towns and rural areas.<sup>280</sup> Moreover, the number of subscriptions making use of xDSL connections decreased by 10.5 per cent to about 163 000.<sup>281</sup>

According to ANRCETI data, the number of active mobile-broadband subscriptions per 100 inhabitants in 2019 was 88.8, up from 79.4 the previous year.<sup>282</sup> ITU official data show the figure standing at 58.8 for 2020; this discrepancy can be explained by differences in accounting methodology.<sup>283</sup> The mobile market sector now accounts for the majority of total telecommunication revenue in the country.<sup>284</sup> In terms of network coverage, 3G covers 99 per cent of Moldova's territory,<sup>285</sup> while 4G networks provide coverage for 95 per cent of the territory,<sup>286</sup> serving 98 per cent of the population according to ITU data.<sup>287</sup> The traffic generated by mobile-broadband users via smartphones increased by 47.2 per cent to about 52.4 million GB, out of a total of 104.7 million GB consumed in the country during the reference period, which increased by 24 per cent.

Despite the overall decline in telecommunication revenues between 2016 and 2019, ANRCETI data indicate that there was a significant increase in sales from 2018 onwards.<sup>288</sup> In 2019, the total number of users accessing mobile broadband based on 4G technology increased by comparison with 2018.<sup>289</sup> In the same year, the market for fixed-broadband Internet access services in Moldova saw a significant increase, with the volume of sales rising by 6.1 per cent year-to-year to reach MDL 1.16 billion (EUR 59.1 million).<sup>290</sup> In 2019 alone, the total amount of mobile-broadband Internet traffic within the country was 0.1 EB.<sup>291</sup>

Moldova does not currently have specific provisions enshrined in law empowering the regulator to request operators for georeferenced data on infrastructure and services. The prevalent rationale

<sup>277</sup> [https://anrceti.md/files/filefield/Anuar%20statistic%202019\\_22aprilie\\_2020.pdf](https://anrceti.md/files/filefield/Anuar%20statistic%202019_22aprilie_2020.pdf).

<sup>278</sup> <https://eufordigital.eu/broadband-access-up-in-moldova-as-users-opt-for-higher-speeds/>; updated data provided by the Ministry of Economy and Infrastructure of Moldova based on the ANRCETI annual report, available at [https://anrceti.md/files/filefield/Anuar%20statistic%202019\\_22aprilie\\_2020.pdf](https://anrceti.md/files/filefield/Anuar%20statistic%202019_22aprilie_2020.pdf).

<sup>279</sup> <https://eufordigital.eu/market-value-of-fixed-broadband-Internet-access-services-in-moldova-exceeded-1-billion-lei-in-first-nine-months-of-2019/>; updated data provided by the Ministry of Economy and Infrastructure of Moldova based on the ANRCETI Annual Report, available at [https://anrceti.md/files/filefield/Anuar%20statistic%202019\\_22aprilie\\_2020.pdf](https://anrceti.md/files/filefield/Anuar%20statistic%202019_22aprilie_2020.pdf).

<sup>280</sup> [https://digital.report/moldova-state-of-affairs-report/#\\_ftn10](https://digital.report/moldova-state-of-affairs-report/#_ftn10).

<sup>281</sup> [www.anrceti.md/news\\_250320](http://www.anrceti.md/news_250320).

<sup>282</sup> [https://anrceti.md/files/filefield/Anuar%20statistic%202019\\_22aprilie\\_2020.pdf](https://anrceti.md/files/filefield/Anuar%20statistic%202019_22aprilie_2020.pdf).

<sup>283</sup> ITU World Telecommunication/ICT Indicators Database online (2021), available at <http://handle.itu.int/11.1002/pub/81550f97-en> (indicator i911mw).

<sup>284</sup> [www.brodynt.com/business-Internet-connectivity-in-moldova/](http://www.brodynt.com/business-Internet-connectivity-in-moldova/).

<sup>285</sup> [https://anrceti.md/files/filefield/Anuar%20statistic%202019\\_22aprilie\\_2020.pdf](https://anrceti.md/files/filefield/Anuar%20statistic%202019_22aprilie_2020.pdf).

<sup>286</sup> [https://anrceti.md/files/filefield/Anuar%20statistic%202019\\_22aprilie\\_2020.pdf](https://anrceti.md/files/filefield/Anuar%20statistic%202019_22aprilie_2020.pdf).

<sup>287</sup> ITU World Telecommunication/ICT Indicators Database online (2020), available at <http://handle.itu.int/11.1002/pub/81550f97-en> (indicator i271GA).

<sup>288</sup> [https://en.anrceti.md/news\\_060420en](https://en.anrceti.md/news_060420en).

<sup>289</sup> [https://en.anrceti.md/news\\_060420en](https://en.anrceti.md/news_060420en).

<sup>290</sup> <https://anrceti.md/news10122019>.

<sup>291</sup> ITU World Telecommunication/ICT Indicators Database online (2020), available at <http://handle.itu.int/11.1002/pub/81550f97-en> (indicator i136mwi).

adopted in the past was based on requesting information solely for statistical purposes.<sup>292</sup> As a result, the country has not yet introduced a mapping system specifically targeting broadband development, although ANRCETI publishes statistical information via an interactive map.<sup>293</sup> However, a more detailed analysis of broadband mapping in Moldova has been carried out as part of the Eastern Partnership (EaP) Countries Broadband Infrastructure Development Strategy project financed by the EU4Digital Initiative, which will provide a comprehensive overview of regulatory and technical developments in the field of broadband mapping, together with country recommendations.<sup>294</sup>

### 3.4.2 Government strategies, status of education quality, and the role of ICTs

In 2014, Moldova adopted its Education Development Strategy 2014-2020 (“Education 2020”), which is the main policy guiding education in the country and is closely aligned with other relevant documents. The strategy has the following objectives:<sup>295</sup>

- Increase access and levels of participation in education and training by expanding access to high-quality pre-school education and providing access to inclusive schooling and a 12-year general compulsory education, increase the attractiveness of and access to vocational/technical education, and increase participation in higher education and adult training programmes.
- Ensure relevance of studying for life, active citizenship and career success by adjusting the content of early education, ensuring the relevance of primary, secondary and vocational/technical education, modernizing university curricula, and promoting scientific research.
- Ensure the effective integration of ICTs into education by providing educational institutions with modern equipment, developing digital literacy and increasing the efficiency of school management through information technology.
- Develop, support and motivate teachers to ensure high-quality education by increasing the attractiveness of the teaching profession, balancing the supply and demand of teachers, improving initial teacher training and creating an efficient system of continuous training.
- Design and institutionalize an effective system of evaluation, monitoring and quality assurance for the education system by developing national standards and creating an institutional framework for quality assurance.
- Optimize resource management by improving educational institutions’ planning and management, achieving efficiency in educational financing, modernizing the infrastructure of educational institutions and providing textbooks and teaching materials.
- Achieve social cohesion while providing high-quality education by expanding students’ participation in decision-making, ensuring effective parent education and developing partnerships in the field of education.

In addition, the “Moldova 2030” national development strategy has already been elaborated and approved, and the “Education 2030” education development strategy is currently in preparation.<sup>296</sup>

<sup>292</sup> [www.itu.int/en/ITU-D/Regional-Presence/Europe/Documents/Events/2020/RRF/20-11-26%20Background%20Paper%20Broadband%20Mapping%20Systems%20in%20Europe%20and%20Regional%20Harmonization%20Initiatives\\_final.pdf](http://www.itu.int/en/ITU-D/Regional-Presence/Europe/Documents/Events/2020/RRF/20-11-26%20Background%20Paper%20Broadband%20Mapping%20Systems%20in%20Europe%20and%20Regional%20Harmonization%20Initiatives_final.pdf).

<sup>293</sup> [www.anrceti.md/bandalarga2019](http://www.anrceti.md/bandalarga2019).

<sup>294</sup> [www.itu.int/en/ITU-D/Regional-Presence/Europe/Documents/Events/2020/RRF/20-11-26%20Background%20Paper%20Broadband%20Mapping%20Systems%20in%20Europe%20and%20Regional%20Harmonization%20Initiatives\\_final.pdf](http://www.itu.int/en/ITU-D/Regional-Presence/Europe/Documents/Events/2020/RRF/20-11-26%20Background%20Paper%20Broadband%20Mapping%20Systems%20in%20Europe%20and%20Regional%20Harmonization%20Initiatives_final.pdf).

<sup>295</sup> [www.globalpartnership.org/content/education-sector-plan-moldova](http://www.globalpartnership.org/content/education-sector-plan-moldova).

<sup>296</sup> Information provided by the Ministry of Economy and Infrastructure of Moldova. See <https://mecc.gov.md/ro/content/elaborarea-strategiei-de-dezvoltarea-educatiei-pentru-anii-2021-2030-educatia-2030>.

OECD PISA<sup>297</sup> results for 2009 reveal that Moldovan students' scores for reading, mathematics and sciences were then among the lowest in the region.<sup>298</sup> According to results from 2015, overall student performance had increased by 15 points in science (to 428); by 28 points in reading (to 416); and by 23 points in mathematics (to 420).<sup>299</sup> In 2018, however, students in Moldova scored lower than the OECD average in reading, mathematics and science. Compared to the OECD average, a smaller proportion of students in Moldova performed at the highest levels of proficiency (Level 5 or 6) in at least one subject; at the same time, a smaller proportion of students achieved a minimum level of proficiency (Level 2 or higher) in at least one subject. Moreover, a large share of students in Moldova<sup>300</sup> attend schools whose principal reported that the school's capacity to provide instruction was hindered greatly or to some extent by a lack of educational material.

In Moldova, socio-economically advantaged students outperformed disadvantaged students in reading by 102 points in PISA 2018. This is larger than the average difference between the two groups (89 points) across OECD countries. In PISA 2009, the performance gap related to socio-economic status was 80 points in Moldova (87 points on average across OECD countries).<sup>301</sup> Data from the 2018 PISA results also suggest that students in urban areas gained more practical knowledge and skills in three areas than their rural peers. The geographical disparity in scores was 64 points in reading, 56 points in science and 55 points in mathematics.<sup>302</sup>

In one of the initiatives within the framework of Education 2020, the Government is prioritizing the improvement of resource management in education. While Moldova is among the European countries allocating the highest share of GDP to the education system, its performance still shows modest results, which may suggest low efficiency in using the budget allocated to investment in education. As reflected in the country's strategy on education, an analysis of the education system shows that inefficient use of school network capacity hinders investment in upgrading institutions and the adequate provision of equipment. Therefore, the Government is currently undertaking reforms to improve planning and management within the network of educational institutions by implementing an EMIS, comprising a register of schools, pupils and teachers based on the school census, as well as regular and accurate collection of data in schools.<sup>303</sup>

Other priority actions in this context include:

- Mapping the network of education institutions by education level;
- Upgrading the network of education institutions by education level in line with regional development prospects for settlement and the demographic situation;
- Diversifying complementary education structures;

<sup>297</sup> PISA tests the reading, mathematics and science performance of 15-year-old pupils across the world every three years. In the context of the European Union, PISA results are particularly important because they feed into the Education and Training 2020 strategic cooperation framework (ET2020). They form the basis for one of the ET2020 benchmarks: the rate of underachievers in reading, mathematics or science among 15-year-olds in the EU should be less than 15 per cent by 2020. Underachievers in PISA are those pupils who fail to reach the minimum proficiency level necessary to participate successfully in society. More information on the PISA indicators and ET2020 is available at [https://ec.europa.eu/education/sites/education/files/document\\_library-docs/pisa-2018-eu\\_1.pdf](https://ec.europa.eu/education/sites/education/files/document_library-docs/pisa-2018-eu_1.pdf).

<sup>298</sup> [www.globalpartnership.org/sites/default/files/moldova-education-strategy-2014-2020.pdf](http://www.globalpartnership.org/sites/default/files/moldova-education-strategy-2014-2020.pdf).

<sup>299</sup> <https://blogs.worldbank.org/education/why-students-moldova-are-performing-better>.

<sup>300</sup> <https://gpseducation.oecd.org/CountryProfile?primaryCountry=MDA&treshold=10&topic=PI>.

<sup>301</sup> [www.oecd.org/pisa/publications/PISA2018\\_CN\\_MDA.pdf](http://www.oecd.org/pisa/publications/PISA2018_CN_MDA.pdf).

<sup>302</sup> <https://en.publika.md/pisa-2018-over-4-in-10-moldovan-students-dont-understand-what-they-read-2660753.html>.

<sup>303</sup> [www.globalpartnership.org/sites/default/files/moldova-education-strategy-2014-2020.pdf](http://www.globalpartnership.org/sites/default/files/moldova-education-strategy-2014-2020.pdf).

- Developing the normative framework to facilitate the provision of private services in education and establishing sectoral, cross-sectoral, national and international partnerships.

The broader objective of improving resources for enhanced management of the education system also has implications for funding allocation, upgrades of school infrastructure and protocols, and the provision of relevant materials such as textbooks.

In terms of Internet access in the educational context, students are familiar with ICTs as a result of the introduction of “Computer science” as a school subject, which is compulsory from seventh grade.<sup>304</sup> Moreover, in 2018, the conceptual basis for the national curriculum was revamped, triggering the revision of the curriculum for school subjects. In addition to the school subject “Technological education”, following the curriculum review conducted in 2018-2020, digital skills training was found to be a transdisciplinary competence which serves as a thread present throughout most scholastic disciplines, instilling safe behaviour in pupils when using the Internet. Additionally, in 2015, the Ministry of Education, Culture and Research developed digital competencies standards for pupils and teachers, which it plans to review by the end of 2021.

However, the Moldovan Government recognizes that students’ familiarity with ICTs is limited by insufficient provision of computers and their use at a later age. According to data from Moldova’s National Bureau of Statistics, schools around the country had about 34 440 computers during the 2020-2021 school year, of which 28 500 were used for teaching purposes.<sup>305</sup> The problem is rooted not only in the insufficient number of computers for the number of enrolled students—which is lower than in the EU—but also in the fact that most computers are outdated. Around 24 000 are over 5 years old and thus warrant replacement in order to conform to the standards adopted by the Ministry of Education, Culture and Research in 2015.<sup>306</sup> Many of these computers are intended and adapted for in-class use rather than distribution to students and teachers or use outside the classroom, as providing IT and other technical support would be challenging.<sup>307</sup> These data, however, contradict the 2015 figures presented by the OECD, which showed 0.5 computers per student at school, compared to an OECD average of 0.77. This suggests a need for clarification on methodologies adopted and the relationship between national and international methodologies.<sup>308</sup>

According to the National Bureau of Statistics, 52.3 per cent of Moldovan families have at least one computer at home, with families from rural areas having a visible disadvantage when compared to those from cities. At the same time, only 41 per cent of the population of Moldova has a computer and only 38.7 per cent have Internet access.<sup>309</sup> These digital inequalities have become a more poignant issue in the context of distance learning induced by the COVID-19 pandemic. Overall, unequal access to ICTs and the Internet has proven to be a demanding

<sup>304</sup> [www.globalpartnership.org/sites/default/files/moldova-education-strategy-2014-2020.pdf](http://www.globalpartnership.org/sites/default/files/moldova-education-strategy-2014-2020.pdf).

<sup>305</sup> National Bureau of Statistics (2021); updated information provided by Moldova’s Ministry of Education and Infrastructure.

<sup>306</sup> [www.unicef.org/moldova/media/4231/file/Working%20Paper%20Education%20and%20COVID-19%20in%20the%20Republic%20of%20Moldova\\_FINAL\\_English%20version.pdf%20.pdf](http://www.unicef.org/moldova/media/4231/file/Working%20Paper%20Education%20and%20COVID-19%20in%20the%20Republic%20of%20Moldova_FINAL_English%20version.pdf%20.pdf).

<sup>307</sup> [www.unicef.org/moldova/media/4231/file/Working%20Paper%20Education%20and%20COVID-19%20in%20the%20Republic%20of%20Moldova\\_FINAL\\_English%20version.pdf%20.pdf](http://www.unicef.org/moldova/media/4231/file/Working%20Paper%20Education%20and%20COVID-19%20in%20the%20Republic%20of%20Moldova_FINAL_English%20version.pdf%20.pdf).

<sup>308</sup> [https://gpseducation.oecd.org/IndicatorExplorer?plotter=h5&query=34&indicators=N051\\*N055\\*N160\\*S016\\*S017\\*S018\\*N052\\*N056\\*N057\\*R001\\*R005\\*N037\\*N038\\*N039\\*N040\\*N041\\*N042\\*T012\\*T013\\*C076\\*P005\\*P006\\*N050\\*T037\\*A256\\*A258\\*A263\\*A264\\*A265\\*P819\\*N122\\*N123\\*N236\\*N237\\*N238\\*N239](https://gpseducation.oecd.org/IndicatorExplorer?plotter=h5&query=34&indicators=N051*N055*N160*S016*S017*S018*N052*N056*N057*R001*R005*N037*N038*N039*N040*N041*N042*T012*T013*C076*P005*P006*N050*T037*A256*A258*A263*A264*A265*P819*N122*N123*N236*N237*N238*N239).

<sup>309</sup> [www.moldova.org/en/learning-online-schools-from-moldova-are-looking-for-solutions-in-the-context-of-coronavirus/](http://www.moldova.org/en/learning-online-schools-from-moldova-are-looking-for-solutions-in-the-context-of-coronavirus/).

challenge for the 16 000 students (4.8 per cent of the total) and 3 000 teachers (10.6 per cent of the total) who lack access to ICTs (laptop, tablets, computers, or even Internet access).

Children and young people who are left behind (e.g. children with disabilities, low-income families) experience an additional layer of challenges in terms of unequal access to distance learning. This situation has made remote education an enormous challenge, even before considering the organization of lessons and monitoring of student learning outcomes for a significant number of students, mostly in families with a lower level of education located in rural areas.<sup>310</sup> This is also relevant for children from the Roma community. In Moldova, Roma children are already more prone to drop out of school in favour of household work; lack of adequate equipment, such as a computer or connection to the Internet, as well as high levels of illiteracy among parents, creates additional obstacles to benefiting from distance learning.<sup>311</sup> In December 2020, the Ministry of Education, Culture and Research, with UNICEF support, organized the fifth Annual National Conference on Inclusive Education. The Conference was held online and attended by approximately 3 000 teachers, representatives of education authorities, specialists, parents and students, marking a decade of implementation of inclusive education. It featured sessions dedicated to the quality of education and the support available for children with special educational needs and disabilities in the context of COVID-19.<sup>312</sup>

In 2020 the Government of the Republic of Moldova allocated MDL 20 million to purchase 2 500 laptops to ensure high-quality distance learning in general education institutions.

### 3.4.3 Multistakeholder partnerships and financing mechanisms fostering investment in school connectivity

Internet provision in schools and universities in Moldova can be traced back to as early as the mid-1990s, when international NGOs expanded the early Internet networks in the country.<sup>313</sup> Furthermore, even before the Digital Moldova 2020 initiative, ICT implementation had been undertaken by the Government since 1997, when programmes such as SALT and other funding mechanisms were focusing on offering broadband Internet access, procuring teaching software and installing at least one computer classroom in every school. Although the amount of equipment available in general educational institutions increased, lack of efficient management, maintenance and budgeting for computer labs became a challenge.<sup>314</sup>

In one of the strategic directions of the Moldova 2020 national strategy, Internet connectivity at school facilities is listed as a priority action. In particular, the strategy recommends that educational policies should support training young people to enable them to actively engage in building and developing a knowledge-based society as the engine for competitive social-economic development across the country as a whole. Within the specific objective of enhancing

<sup>310</sup> [www.unicef.org/moldova/media/4231/file/Working%20Paper%20Education%20and%20COVID-19%20in%20the%20Republic%20of%20Moldova\\_FINAL\\_English%20version.pdf%20.pdf](http://www.unicef.org/moldova/media/4231/file/Working%20Paper%20Education%20and%20COVID-19%20in%20the%20Republic%20of%20Moldova_FINAL_English%20version.pdf%20.pdf).

<sup>311</sup> [www.ilo.org/wcmsp5/groups/public/---europe/---ro-geneva/---sro-budapest/documents/publication/wcms\\_631869.pdf](http://www.ilo.org/wcmsp5/groups/public/---europe/---ro-geneva/---sro-budapest/documents/publication/wcms_631869.pdf).

<sup>312</sup> [www.unicef.org/media/93756/file/ECAR%20COVID-19%20Situation%20Report%20No.%2016%20End%20of%20year%202020.pdf](http://www.unicef.org/media/93756/file/ECAR%20COVID-19%20Situation%20Report%20No.%2016%20End%20of%20year%202020.pdf).

<sup>313</sup> [https://en.wikipedia.org/wiki/Internet\\_in\\_Moldova](https://en.wikipedia.org/wiki/Internet_in_Moldova).

<sup>314</sup> [www.who.int/goe/policies/countries/mda\\_support1.pdf?ua=1](http://www.who.int/goe/policies/countries/mda_support1.pdf?ua=1).

access to high-quality education by providing educational institutions with modern equipment for use in education, the following specific priority actions are set out:<sup>315</sup>

- Implementing the “One computer for each pupil” pilot project in 10 schools, since 2013;
- Drafting a medium-term plan on the provision of education institutions with modern equipment, access to the Internet and the infrastructure necessary for successful use of ICTs in the education process;
- Providing school libraries with modern equipment and access to the Internet so that the information and documentation needs of pupils and teachers are met.
- Providing access to high-quality education by introducing distance-learning models, especially for pupils in small schools;
- Facilitating the creation of networks for communication and exchange of best practices among teachers;
- Providing schools with the special equipment needed to train people with disabilities.

Alongside the infrastructure aspect of Internet provision, Digital Moldova 2020 also details the importance of digital literacy and ways in which the national curriculum can be adjusted to a more well-rounded use of ICTs for students and teachers alike.<sup>316</sup>

In October 2013, the Moldovan Government approved a decision to provide 1 200 computers, 220 printers, 50 hubs and free Internet for schools across the country, with the aim of increasing access to information and creating better conditions for education, development and realizing young people’s potential. The list of beneficiary institutions was drawn up by the Ministry of Education, Culture and Research based on the needs of each institution.<sup>317</sup>

In June 2020, the Ministry launched a nationwide campaign entitled “Donate Computers for Education” as part of its goal to help digitalize Moldova’s education system.<sup>318</sup> The campaign’s main goals include providing schools with computers and Internet connections, creating conditions for people interested in donating computers to pupils to do so, and connecting companies that can donate computers and IT with schools in need.<sup>319</sup> Within the framework of this initiative, the Ministry developed an interactive map on which potential donors can identify the number of teachers and students lacking computer technology in each district.<sup>320</sup> Donors can then find telephone numbers for representatives of local specialist bodies in the field of education, which explain the necessary steps to ensure the donation reaches the chosen recipient. To ensure transparency and visibility, donors receive a donation document that must be completed and signed.<sup>321</sup>

In June 2021, the Ministry of Education, Culture and Research, the Moldova Competitiveness Project, Tekwill, and the telecommunication companies Orange Moldova, Starnet, Moldcell and Moldtelecom, signed a Memorandum of Understanding to support Internet connectivity in schools and the use of digital technologies in education. At the request of the Ministry, the telecommunication companies have offered 50 GB of free Internet access per month for the period March to May 2020 and 80 GB of free Internet access per month for the period April to May 2021, to all teachers and students who expressed a need. This has enabled 16 000 students

<sup>315</sup> [www.globalpartnership.org/sites/default/files/moldova-education-strategy-2014-2020.pdf](http://www.globalpartnership.org/sites/default/files/moldova-education-strategy-2014-2020.pdf).

<sup>316</sup> [http://mei.gov.md/sites/default/files/strategia\\_moldova\\_digitala\\_2020\\_857.pdf](http://mei.gov.md/sites/default/files/strategia_moldova_digitala_2020_857.pdf).

<sup>317</sup> <https://mecc.gov.md/en/node/126>.

<sup>318</sup> <https://mecc.gov.md/ro/content/ministerul-educatiei-culturii-si-cercetarii-lansat-campania-nationala-doneaza-un-computer>.

<sup>319</sup> [www.moldpres.md/en/news/2020/06/04/20004540](http://www.moldpres.md/en/news/2020/06/04/20004540).

<sup>320</sup> <https://mecc.gov.md/ro/content/doneazauncomputer>.

<sup>321</sup> <https://drive.google.com/file/d/1NEhQiHtAuX-BFmCOJyf8wyJoOwChwRDF/view>.



and teachers in general and technical vocational education to benefit from Internet access in order to effectively participate in the online educational process.<sup>322</sup>

In addition, as part of a project supported by the World Bank, entitled “Education Reform in Moldova”, in 2021 the Ministry purchased 10 000 laptops and sent them to educational institutions, so as to provide students and teachers with computers for temporary use.<sup>323</sup>

### 3.4.4 National responses to COVID-19 and educational initiatives for distance learning

In mid-March 2020, Moldova shut down all schools in response to the COVID-19 outbreak, thus mandating schools in the country to provide distance learning opportunities for over 434 000 students.<sup>324</sup> In the face of the emergency, Moldova undertook many activities to ensure that learning continued under the new conditions imposed by the pandemic.

In late March 2020, the UNICEF office in Moldova received a USD 70 000 grant from the Global Partnership for Education to support the Ministry of Education, Culture and Research in developing a COVID-19 response plan in coordination with donors and development partners. Since then, the country has used these funds to increase access to distance learning by providing IT devices for students and teachers and by distributing learning packages to the most disadvantaged children, who have no access to IT.

To deal with the lack of appropriate ICT equipment and gaps in Internet connectivity, the Ministry distributed educational packages for children with disabilities<sup>325</sup> and children with no IT access, as well as online informational materials about free online resources for distance learning and positive parenting during the pandemic and subsequent recovery period.<sup>326</sup> Initiatives addressing the ICT and connectivity gaps also came from other third sector organizations. Arigatou International – End Child Poverty, through a partnership in Moldova with the Global Network of Religions for Children, facilitated the purchase of tablets and Internet connectivity for several children living in poverty who were not able to participate in online learning owing to a lack of Internet access and appropriate devices.<sup>327</sup> The Moldovan Government also launched training for teachers on remote education, positive parenting guidance, and video and television tutorials for national examination preparation.<sup>328</sup> Additional support for parents was offered via a guide for families with children of pre-school age, developed in cooperation with the Ministry of Education, Culture and Research, the Ministry of Health, Labour and Social Protection, the National Agency for Public Health, the National Agency for Food Security, the World Health Organization (WHO) and UNICEF, featuring the organization of education and care during COVID-19 and available in Romanian and Russian.

<sup>322</sup> Information provided by the Ministry of Economy and Infrastructure.

<sup>323</sup> Information provided by the Ministry of Economy and Infrastructure.

<sup>324</sup> [www.unicef.org/moldova/media/4231/file/Working%20Paper%20Education%20and%20COVID-19%20in%20the%20Republic%20of%20Moldova\\_FINAL\\_English%20version.pdf%20.pdf](http://www.unicef.org/moldova/media/4231/file/Working%20Paper%20Education%20and%20COVID-19%20in%20the%20Republic%20of%20Moldova_FINAL_English%20version.pdf%20.pdf).

<sup>325</sup> [www.oecd-ilibrary.org/education/education-policies-for-students-at-risk-and-those-with-disabilities-in-south-eastern-europe/moldova\\_9789264036161-8-en;jsessionid=MMkBe7GsGoQLjDBWUJEitpnE.ip-10-240-5-25](http://www.oecd-ilibrary.org/education/education-policies-for-students-at-risk-and-those-with-disabilities-in-south-eastern-europe/moldova_9789264036161-8-en;jsessionid=MMkBe7GsGoQLjDBWUJEitpnE.ip-10-240-5-25).

<sup>326</sup> [www.unicef.org/moldova/media/4231/file/Working%20Paper%20Education%20and%20COVID-19%20in%20the%20Republic%20of%20Moldova\\_FINAL\\_English%20version.pdf%20.pdf](http://www.unicef.org/moldova/media/4231/file/Working%20Paper%20Education%20and%20COVID-19%20in%20the%20Republic%20of%20Moldova_FINAL_English%20version.pdf%20.pdf).

<sup>327</sup> <https://endingchildpoverty.org/en/news/in-the-news/563-helping-children-learn-online-in-moldova-during-the-covid-19-pandemic>.

<sup>328</sup> [www.unicef.org/moldova/media/4231/file/Working%20Paper%20Education%20and%20COVID-19%20in%20the%20Republic%20of%20Moldova\\_FINAL\\_English%20version.pdf%20.pdf](http://www.unicef.org/moldova/media/4231/file/Working%20Paper%20Education%20and%20COVID-19%20in%20the%20Republic%20of%20Moldova_FINAL_English%20version.pdf%20.pdf).

Moreover, CCF Moldova and UNICEF, with support from the United States Agency for International Development (USAID), prepared a guide for parents of children in primary and general secondary schools in preparation for the reopening of schools in the academic year 2020-2021.<sup>329</sup> The Ministry of Education, Culture and Research disseminated the guides before the start of the school year on 1 September. Additionally, relevant government agencies in Moldova, in cooperation with UNICEF, WHO and the United Nations Population Fund (UNFPA), developed a guide for students<sup>330</sup> in primary and general secondary education in preparation for the 2020-2021 academic year. In particular in the context of minority students such as Roma children in Nicoreni village, Drochia district, UNICEF—with USAID support—provided supplies and educational kits for these communities.

In July 2020, in response to the COVID-19 crisis, a Memorandum of Understanding entitled “Development of Digital Skills, IT and STEM throughout Life” was signed by the Ministry of Economy and Infrastructure, the Ministry of Education, Culture and Research, the National Association of Information Technology and Communications Companies and the Tekwill ICT Training and Innovation Centre.<sup>331</sup> This document provides information on the use of digital technologies at all school levels. By specifying the role of teachers in preparing students for the digital transformation and by including teacher training in the adoption and promotion of information technologies, the document ensures the quality and relevance of ICT skills for professional activity in a digital economy and harmonizes ICT education in Moldova with current labour market requirements.<sup>332</sup>

In early September 2020, UNICEF chaired the weekly regular meeting of the UN-coordinated Education Task Force for COVID-19, at which participants were updated on the actions of authorities and partners to ensure that the new school year began in safe conditions. UNICEF also presented a paper entitled “Education and COVID-19 in the Republic of Moldova: Grasping the opportunity the learning crisis presents to build a more resilient education system”<sup>333</sup> with the UN Resident Coordinator Office, the Ministry of Education, Culture and Research, and GPE. The paper highlights the Moldovan context, while also building upon the recommendations mentioned in the United Nations policy brief on “Education during COVID-19 and beyond”.<sup>334</sup> The meeting discussed further assessments needing to be carried out in the area of education to better plan interventions for remediation.

In late September 2020, the Ministry of Education, Culture and Research and Microsoft signed a Memorandum of Understanding, which will support the education system in using the most innovative information technologies. The agreement will enable educational institutions in the country to gain access to Office 365 A1, interactive platforms for teacher training, and support in implementing the distance learning and mixed models.<sup>335</sup>

The Ministry also launched the National Digital Literacy Programme for Teachers in July 2020. The programme is targeted at teachers in both general and technical vocational education and provides comprehensive training on the use of those digital applications and tools most

<sup>329</sup> [www.unicef.org/moldova/rapoarte/cum-poti-sustine-copilul-tau-in-contextul-pandemiei-covid-19?fbclid=IwAR3UKy1ErbLp9x01vGsECzkrIZvy\\_rHh6ekLhjllpMoU5dwH6snT72PDWQo](http://www.unicef.org/moldova/rapoarte/cum-poti-sustine-copilul-tau-in-contextul-pandemiei-covid-19?fbclid=IwAR3UKy1ErbLp9x01vGsECzkrIZvy_rHh6ekLhjllpMoU5dwH6snT72PDWQo).

<sup>330</sup> [www.unicef.org/moldova/rapoarte/la-%C8%99coal%C4%83-%C3%AEn-siguran%C8%9B%C4%83](http://www.unicef.org/moldova/rapoarte/la-%C8%99coal%C4%83-%C3%AEn-siguran%C8%9B%C4%83).

<sup>331</sup> <https://mei.gov.md/ro/content/ministrul-sergiu-railean-tehnologia-si-inovatia-reprezinta-viitorul>.

<sup>332</sup> <https://eufordigital.eu/moldova-moves-to-develop-digital-skills-in-schools/>.

<sup>333</sup> [www.unicef.org/moldova/en/reports/education-and-covid-19-republic-moldova](http://www.unicef.org/moldova/en/reports/education-and-covid-19-republic-moldova).

<sup>334</sup> [www.un.org/development/desa/dspd/wp-content/uploads/sites/22/2020/08/sg\\_policy\\_brief\\_covid-19\\_and\\_education\\_august\\_2020.pdf](http://www.un.org/development/desa/dspd/wp-content/uploads/sites/22/2020/08/sg_policy_brief_covid-19_and_education_august_2020.pdf).

<sup>335</sup> <https://news.microsoft.com/en-cee/2020/09/30/microsoft-supports-the-education-system-in-moldova/>.

important for the teaching process. Between July and September 2020, about 20 000 primary, secondary and high-school teachers received training.<sup>336</sup> In July 2021, the programme will continue in its second phase, with plans to train about 9 000 pre-school teachers with the support of UNICEF.<sup>337</sup>

Furthermore, the Government sought to establish several public-private partnerships to alleviate gaps in digitalization and their negative impacts on educational outcomes for students. One example is the Connecting Teachers campaign, which was made possible with the support of Orange Moldova. Additionally, Moldtelecom and Moldcell, in cooperation with the Ministry, provided free access to 50 GB data packages<sup>338</sup> for teachers during the first two months of the COVID-19 pandemic.<sup>339</sup> Another example was the launch of the websites Educație Online<sup>340</sup> and Învăț.Online,<sup>341</sup> developed under the leadership of the Mayor of Chisinau and Association of ICT Companies, respectively. These are two examples of education content digitalization to facilitate the remote teaching process. Some schools have also installed Wi-Fi in order to give their staff a place to work, but many schools do not have sufficient resources to do so.

In 2017, as a part of the extensive educational reform with which the Ministry of Education, Culture and Research has engaged with the assistance of the World Bank, an EMIS was created. This project was implemented with the support of the Centre for Information and Communication Technologies in Education, district education departments and schools from across the whole country. The EMIS allows the planning and management of educational resources at the national level. The system accumulates and systemizes data about institutions, infrastructure, pupils, classes, evaluations, school dropout, school networks, distance between pupils' home and school, budget of institutions and districts/municipalities/autonomous territorial units, and teaching, managerial, non-teaching and auxiliary staff, among other categories.

The EMIS contains separate modules for different levels of education: pre-school, general and vocational. It stores various data on every element of the educational process, making it possible to analyse the educational system from different aspects and incorporate such data into evidence-based policy- and decision-making.

One of the most important projects for the digitalization of the education system is including electronic registers in the educational process at general education institutions. The Ministry of Education, Culture and Research has developed an "Electronic catalogue" module within the EMIS. During the 2020-2021 academic year, the process of piloting the system in 180 general education institutions was initiated. The most important benefits were identified as:

- Uninterrupted and synchronous access to the electronic catalogue of all participants in the educational process;
- High level of security, providing limited access to information/operations in the system, depending on the user's rights.
- Ensuring physical security;

<sup>336</sup> <https://mecc.gov.md/ro/content/ministerul-educatiei-culturii-si-cercetarii-lansat-programul-national-de-alfabetizare>; additional information provided by the Ministry of Economy and Infrastructure.

<sup>337</sup> Information provided by the Ministry of Economy and Infrastructure.

<sup>338</sup> <https://mecc.gov.md/en/node/9318>.

<sup>339</sup> <https://noi.md/ru/obshhestvo/chto-predprinimaet-minobrazovaniya-dlya-obespecheniya-distancionnogo-obucheniya>.

<sup>340</sup> [www.educatieonline.md/](http://www.educatieonline.md/).

<sup>341</sup> <https://invat.online/>.

- The principle of interaction with other government systems, ensuring the exclusion of repeated data entry;
- Reporting according to several criteria;
- Ability to perform in-depth data analysis to improve the quality of organization of educational processes;
- Storing data in electronic archives does not require additional premises and special actions.

The Ministry of Education, Culture and Research has set up a National Group for the Coordination of Safety in Education to monitor the process and discuss policy options.<sup>342</sup> However, student responses to remote learning indicate that about 35 per cent of students report limited or lack of free time or time for rest, with an accentuated gender disparity (40 per cent of girls compared to 29 per cent of boys).<sup>343</sup> To address these socio-emotional impacts, the Ministry developed instructions on the organization of psychological assistance for children/pupils, parents and teachers during the suspension of the educational process<sup>344</sup> and methodological guidelines on healthy lifestyles during quarantine, and subsequently launched an educational programme for psychological assistance for young people, parents, teachers and educational psychologists. In order to ensure the safety and security of children in the online environment, the Ministry, with support from the La Strada International Centre, the Ministry of Internal Affairs and the National Council for Child Rights Protection, has developed methodological guidelines on online safety and student security in the distance learning process for primary, secondary and high school. Multiple training sessions were held for teachers, school psychologists and parents.<sup>345</sup>

Moreover, the Education Reform in Moldova project is supporting the Government of Moldova's reform programme by financing activities that will improve the quality of education and lead to a more efficient education sector. Through this project, the World Bank supports the Government of Moldova in implementing reforms, which include initiatives for:

- Improving learning conditions in targeted schools;
- Strengthening education monitoring systems; and
- Promoting efficiency reforms in the education sector.

For digitalization and Internet connectivity, the following actions have been performed as part of this project:

- Procuring 10 000 laptops for remote learning in general education, which fully covered the needs of students from 5th to 12th grades in accessing the remote learning process;
- Providing 23 schools renovated under the project with IT equipment (laptops, printers, projectors, interactive whiteboards);
- Providing 100 schools with specialized IT equipment for students with special educational needs and/or disabilities;
- Improving the quality of data and the EMIS, specifically by developing and incorporating a vocational education and training module into the EMIS and modernizing the EMIS portal for open data for public use;
- Procuring specialized software to be used by teaching support staff and educational psychologists working with students with special educational needs and/or disabilities;
- Procuring IT equipment for PISA 2021 (200 laptops and 200 memory sticks);

<sup>342</sup> <https://reliefweb.int/sites/reliefweb.int/files/resources/UN%20Moldova%20Covid-19%20Situation%20Report%204September2020.pdf>.

<sup>343</sup> National Pupils Council (June 2020).

<sup>344</sup> Ministry of Education, Culture and Research (27 March 2020).

<sup>345</sup> Information provided by the Ministry of Economy and Infrastructure.

- Procuring IT equipment for the National Agency for Quality Assurance in Education and Research (4 laptops, 2 video projectors, 1 interactive table, 10 USB external memory drives) for use in training.

In 2020, the Ministry of Education, Culture and Research signed a Memorandum of Understanding with Microsoft, under which a strategic partnership will be built to support the education system in Moldova using the most innovative information technologies. Through this partnership, educational institutions in the country will gain access to Office 365 A1, interactive platforms for teacher development and training, and support in implementing distance education methods.

The Ministry of Education, Culture and Research and Google have signed a Memorandum of Understanding on the implementation of Google for Education in Moldova. The partnership with Google was facilitated by the Moldova Competitiveness Project, funded by USAID, Sweden and UK Aid through the Clasa Viitorului (“Class of the Future”) Centre, which will provide advice and technical support to train educational representatives in the use of the Google Education app suite.

For the 2020-2021 school year, the Government has proposed seven models for how to organize the education process. Each school is advised to select from the proposed models in consultation with local education authorities and the school community, including parents, teachers and students.<sup>346</sup> The Ministry of Education, Culture and Research has also created several resources, including a master list of recommended remote education technologies, alongside other methodologies<sup>347</sup> on remote education.<sup>348</sup> The document establishes a blueprint for the continuation of the educational process in primary, secondary and high school institutions in quarantine conditions when the physical presence of students in classrooms is restricted.

Another public-private educational project that has been launched with the support of the Government and other stakeholders is the Future Classroom Lab.<sup>349</sup> This is a pilot project implemented in Moldovan educational institutions. It brings a new concept in pedagogy, offering an open and inspirational learning space with interdisciplinary and innovative approaches through the use of digital technologies that favour a student-centric learning process. The Class of the Future project is a public-private partnership involving the Ministry of Education, Culture and Research<sup>350</sup> and financial support from USAID, Sweden and the United Kingdom, with the Moldova Competitiveness Project, the Orange Moldova Foundation, the University Information Centre, and the Liechtenstein Development Services Foundation (LED).<sup>351</sup> The project also involves developing the National Centre for Digital Innovation in Education, which operates at the Ion Creanga State Pedagogical University, in collaboration with Tiraspol State University. By June 2021, the Class of the Future concept had been implemented in 31 institutions across 21 of the country’s regions. The technology partner for Class of the Future is Google. Following training within the National Digital Literacy Programme and other programmes offered by the National Centre for Digital Innovation in Education, about 21 000 teachers received free Google

<sup>346</sup> For a more detailed description of the seven models, please refer to the website of the Ministry of Education, Culture and Research (13 July 2020).

<sup>347</sup> <https://mecc.gov.md/ro/content/ministerul-educatiei-culturii-si-cercetarii-aprobat-metodologia-privind-continuarea-la>.

<sup>348</sup> [https://mecc.gov.md/sites/default/files/ordin\\_mecc\\_invatamant\\_la\\_distanta.pdf](https://mecc.gov.md/sites/default/files/ordin_mecc_invatamant_la_distanta.pdf).

<sup>349</sup> [www.clasaviitorului.md/despre-noi/](http://www.clasaviitorului.md/despre-noi/).

<sup>350</sup> <https://mecc.gov.md/ro/content/ministerul-educatiei-culturii-si-cercetarii-prezinta-tutoriale-video-de-pregatire-pentru>.

<sup>351</sup> [www.moldova.org/en/learning-online-schools-from-moldova-are-looking-for-solutions-in-the-context-of-coronavirus/](http://www.moldova.org/en/learning-online-schools-from-moldova-are-looking-for-solutions-in-the-context-of-coronavirus/).

Workspace (formerly G Suite) accounts and were able to use all the educational applications offered by this package.

Despite these extensive tools and initiatives, a nationwide survey of educators in Moldova revealed that some teachers still struggle to use the recommended technologies appropriately.<sup>352</sup> On the other hand, some wished that government guidelines could have been applied more narrowly by their own school or institution, because using the same platforms could have enabled staff to better assist one another during the transition.<sup>353</sup> To fill these gaps in teachers' competencies for quality, inclusive digital and distance learning, the Government has paired support for teachers—in the form of ICT tools and connectivity, teaching content, and professional, psychological and emotional support—with teacher training.<sup>354</sup> UNICEF has supported teacher training efforts, reaching almost 10 500 educators with training on distance education delivery by the end of 2020.<sup>355</sup> Importantly, UNICEF has also supported the production of a set of training materials, including video lessons in Romanian and Russian on the topic of child online safety for education stakeholders.<sup>356</sup>

## 3.5 Montenegro

### 3.5.1 Overview of the education system and status of broadband

In Montenegro, education is considered a key factor in societal development, and the country has continuously implemented reforms in this area to make the educational system compliant with modern trends and quality. As a way to address challenges in education access and quality and to harmonize its education system with those of EU countries, Montenegro has started an extensive process of education system reform at all levels, with the adoption of its main strategic document, the “Book of Changes”, in 2001. This corresponded with the country's reforms to the ICT sector with the introduction of the Telecommunications Act and the creation of a regulator, the Agency for Electronic Communications and Postal Services (EKIP).<sup>357</sup> Reforms were preceded by the adoption of new laws and amendments, changes appropriate to each level of education, and harmonization with EU legislation. As articulated in the 2002 General Education Act,<sup>358</sup> primary education is compulsory for all children from the ages of 6 to 14 years,<sup>359</sup> regardless of gender, race, religion, social background or any other personal characteristic.<sup>360</sup> It lasts for nine years and is divided into three cycles, meaning that primary and lower secondary education in Montenegro are organized as a single system. General secondary education, on the other hand, is not mandatory<sup>361</sup> and is offered in *gimnazija* (academically oriented secondary school), combined secondary schools (offering general and vocational education), vocational schools and art schools.<sup>362</sup>

<sup>352</sup> <https://expertforum.ro/scoalapentrudemocratie/files/2020/04/PB-84-scoli.pdf>.

<sup>353</sup> <https://jordanrussiacenter.org/news/moldovan-education-during-the-covid-19-pandemic/>.

<sup>354</sup> <http://tcg.uis.unesco.org/survey-education-covid-school-closures/>.

<sup>355</sup> UNICEF Humanitarian Action for Children regional indicator reporting.

<sup>356</sup> UNICEF Europe and Central Asia Region COVID-19 response in education questionnaire, March 2021.

<sup>357</sup> <http://wbc-inco.net/object/event/6078/attach/Montenegrofinal.pdf>.

<sup>358</sup> <https://mps.gov.me/ResourceManager/FileDownload.aspx?rid=310046&rType=2&file=Opsti%20zakon%20o%20obrazovanju%20i%20vaspitanju.pdf>.

<sup>359</sup> <http://uis.unesco.org/en/country/me>.

<sup>360</sup> [www.unicef.org/montenegro/media/2976/file/MNE-media-MNEpublication44.pdf](http://www.unicef.org/montenegro/media/2976/file/MNE-media-MNEpublication44.pdf).

<sup>361</sup> [https://eacea.ec.europa.eu/national-policies/eurydice/content/montenegro\\_en](https://eacea.ec.europa.eu/national-policies/eurydice/content/montenegro_en).

<sup>362</sup> [www.ibe.unesco.org/sites/default/files/Montenegro.pdf](http://www.ibe.unesco.org/sites/default/files/Montenegro.pdf).

There are 23 public pre-schools; 30 private pre-schools; 162 public primary schools; 5 private international primary schools; 50 public, 1 state-private and 4 private secondary schools, and 2 state education centres.<sup>363</sup> According to data from UNESCO's UIS database, these schools have some 112 165 students: 16 184 children enrolled at pre-school level,<sup>364</sup> 39 085 students in primary/elementary education,<sup>365</sup> and 56 896 students at secondary level.<sup>366</sup> Notably, as reported by the European Commission, the importance of early childhood education and care continues to be promoted, and kindergarten outreach services are available in some rural areas. Participation rates for 0-5-year-olds showed a small increase from 48 per cent in 2018 to 52 per cent in 2019.<sup>367</sup> The completion rate for children of primary school age is 96 per cent,<sup>368</sup> and even lower for some of the most marginalized children. Completion rates for Roma, for example, are 56 per cent.<sup>369</sup> Out-of-school rates for primary education are notably low—less than 1 per cent for 2019, according to UIS data. Participation in education at the upper secondary level follows regional patterns in being lower than at other levels, as evidenced by the adjusted net attendance rate for youth of upper secondary school age (88 per cent in 2018)<sup>370</sup> and the out-of-school rate among adolescents of upper secondary age (11 per cent in 2019).<sup>371</sup> Secondary completion rates are approximately 86 per cent overall<sup>372</sup> and much lower for the most marginalized, such as for Roma, whose secondary completion rates are 3 per cent.<sup>373</sup> The total number of out-of-school children and adolescents, however, is the smallest in the region at just under 6 000, a reflection of the country's small population.<sup>374</sup>

Regarding quality, UNESCO data show that a literacy rate for the 15-24 years age group in Montenegro of 99.1 per cent. Still, however, just over half (50.6 per cent) of children and adolescents do not achieve minimum proficiency in foundational skills,<sup>375</sup> leading to cumulative learning gaps and limiting opportunities for further learning and skills development.

Data from 2018 show that the country's expenditure on education was about 4 per cent of GDP,<sup>376</sup> while the EU average for 2017 was 4.7 per cent.<sup>377</sup> A 2020 assessment by the European Commission has shown that investments in school infrastructure and equipment have resulted in the construction or refurbishment of schools across the country, with an additional 107 projects

<sup>363</sup> <https://skolskastatistika.edu.me/>.

<sup>364</sup> <http://data.uis.unesco.org/#> (indicator: enrolment in pre-primary education, both sexes).

<sup>365</sup> <http://data.uis.unesco.org/#> (indicator: enrolment in primary education, both sexes).

<sup>366</sup> <http://data.uis.unesco.org/#> (indicator: enrolment in secondary education, both sexes).

<sup>367</sup> [https://ec.europa.eu/neighbourhood-enlargement/sites/near/files/montenegro\\_report\\_2020.pdf](https://ec.europa.eu/neighbourhood-enlargement/sites/near/files/montenegro_report_2020.pdf).

<sup>368</sup> [https://wcmprod.unicef.org/montenegro/sites/unicef.org.montenegro/files/2019-12/MNE\\_MICS6%20Statistical%20Snapshot%20Education%20ENG\\_Montenegro%202018\\_FINAL.pdf](https://wcmprod.unicef.org/montenegro/sites/unicef.org.montenegro/files/2019-12/MNE_MICS6%20Statistical%20Snapshot%20Education%20ENG_Montenegro%202018_FINAL.pdf).

<sup>369</sup> [https://wcmprod.unicef.org/montenegro/sites/unicef.org.montenegro/files/2019-12/MNE\\_MICS6%20Statistical%20Snapshot%20Education%20ENG\\_Montenegro%20Roma%20Settlements%202018\\_FINAL.pdf](https://wcmprod.unicef.org/montenegro/sites/unicef.org.montenegro/files/2019-12/MNE_MICS6%20Statistical%20Snapshot%20Education%20ENG_Montenegro%20Roma%20Settlements%202018_FINAL.pdf).

<sup>370</sup> [https://wcmprod.unicef.org/montenegro/sites/unicef.org.montenegro/files/2019-12/MNE\\_MICS6%20Statistical%20Snapshot%20Education%20ENG\\_Montenegro%202018\\_FINAL.pdf](https://wcmprod.unicef.org/montenegro/sites/unicef.org.montenegro/files/2019-12/MNE_MICS6%20Statistical%20Snapshot%20Education%20ENG_Montenegro%202018_FINAL.pdf).

<sup>371</sup> According to UIS data from 2019.

<sup>372</sup> [https://wcmprod.unicef.org/montenegro/sites/unicef.org.montenegro/files/2019-12/MNE\\_MICS6%20Statistical%20Snapshot%20Education%20ENG\\_Montenegro%202018\\_FINAL.pdf](https://wcmprod.unicef.org/montenegro/sites/unicef.org.montenegro/files/2019-12/MNE_MICS6%20Statistical%20Snapshot%20Education%20ENG_Montenegro%202018_FINAL.pdf).

<sup>373</sup> [https://wcmprod.unicef.org/montenegro/sites/unicef.org.montenegro/files/2019-12/MNE\\_MICS6%20Statistical%20Snapshot%20Education%20ENG\\_Montenegro%20Roma%20Settlements%202018\\_FINAL.pdf](https://wcmprod.unicef.org/montenegro/sites/unicef.org.montenegro/files/2019-12/MNE_MICS6%20Statistical%20Snapshot%20Education%20ENG_Montenegro%20Roma%20Settlements%202018_FINAL.pdf).

<sup>374</sup> <http://data.uis.unesco.org> (number of out-of-school children, adolescents and youth of primary and secondary school age, both sexes).

<sup>375</sup> UNICEF calculation of the number of students in primary, lower secondary and upper secondary school not achieving minimum proficiency in mathematics; data for Montenegro are based on the latest available figures from UIS and OECD PISA data (<http://uis.unesco.org/en/country/me>).

<sup>376</sup> [https://ec.europa.eu/neighbourhood-enlargement/sites/near/files/montenegro\\_report\\_2020.pdf](https://ec.europa.eu/neighbourhood-enlargement/sites/near/files/montenegro_report_2020.pdf).

<sup>377</sup> <https://data.worldbank.org/indicator/SE.XPD.SECO.PC.ZS?locations=EU>.

in the pipeline by 2020. Although work to remove physical barriers was completed at several schools during 2019, physical accessibility remains an important issue to address.<sup>378</sup>

In terms of organization, educational policy is created at the central level under the auspices of the Ministry of Education, Science, Culture and Sports.<sup>379</sup> As such, the public financing of pre-university education is carried out by the Ministry, with small contributions from municipal governments and the Ministry of Finance and Social Welfare.

Concerning broadband development in the country, ITU data show that 81.4 per cent of individuals in Montenegro used the Internet in 2020.<sup>380</sup> The northern region of Montenegro remains the least connected, with only 64.8 per cent of households having some level of Internet usage.<sup>381</sup> The same data report also shows that, while 80 per cent of households in urban areas were connected in 2019 (representing a 3.7 per cent increase over 2018), the figure for rural areas was 62.8 per cent. In terms of household connectivity, data from country's State Statistical Office show that 74.3 per cent of households surveyed had access to the Internet in 2019, which represents an increase of 2.1 per cent in relation to the previous year.<sup>382</sup>

In 2020, the number of mobile-broadband subscriptions per 100 inhabitants was 85.9,<sup>383</sup> with this number increasing by 16.4 per cent between 2018 and 2020. In terms of the quality of mobile networks, EKIP has recently revealed that Crnogorski Telekom's mobile network offers the highest download speed in urban areas, at 47.5 Mbit/s, followed by Telenor (43.5 Mbit/s) and M:tel (22.5 Mbit/s).<sup>384</sup> By 2019, 4G/LTE networks covered 97.65 per cent of the population of Montenegro,<sup>385</sup> with an average download speed of 10 Mbit/s.<sup>386</sup> 3G coverage was available to 98.3 per cent of Montenegro's population in 2020.<sup>387</sup> In 2019 alone, mobile-broadband Internet traffic within the country totalled 0.041 EB.<sup>388</sup>

In Montenegro, the rules regulating the mapping of electronic communications include three main pieces of legislation.<sup>389</sup> Based on these documents, EKIP has implemented a system for mapping electronic communications infrastructure, with the aim of providing appropriate data access to stakeholders.<sup>390</sup> The mapping system seeks to: (i) increase the common use of electronic communication infrastructure (ducts, antenna poles, buildings/facilities, cable drainage, low voltage poles and public lighting posts); (ii) improve planning documentation;

<sup>378</sup> [https://ec.europa.eu/neighbourhood-enlargement/sites/near/files/montenegro\\_report\\_2020.pdf](https://ec.europa.eu/neighbourhood-enlargement/sites/near/files/montenegro_report_2020.pdf).

<sup>379</sup> [www.esiweb.org/pdf/montenegro\\_answers-to-the-ec-questionnaire/Chapters%2022-33/Chapter%2026%20%20Education%20and%20culture/Answers%20I.pdf](http://www.esiweb.org/pdf/montenegro_answers-to-the-ec-questionnaire/Chapters%2022-33/Chapter%2026%20%20Education%20and%20culture/Answers%20I.pdf).

<sup>380</sup> ITU World Telecommunication/ICT Indicators Database online (2021), available at <http://handle.itu.int/11.1002/pub/81550f97-en> (indicator i99H).

<sup>381</sup> [www.monstat.org/userfiles/file/ICT/2019/ICT%20USAGE%20IN%20HOUSEHOLDS%20IN%202019.pdf](http://www.monstat.org/userfiles/file/ICT/2019/ICT%20USAGE%20IN%20HOUSEHOLDS%20IN%202019.pdf).

<sup>382</sup> [www.monstat.org/userfiles/file/ICT/2019/ICT%20USAGE%20IN%20HOUSEHOLDS%20IN%202019.pdf](http://www.monstat.org/userfiles/file/ICT/2019/ICT%20USAGE%20IN%20HOUSEHOLDS%20IN%202019.pdf).

<sup>383</sup> ITU World Telecommunication/ICT Indicators Database online (2021), available at <http://handle.itu.int/11.1002/pub/81550f97-en> (indicator i911mw).

<sup>384</sup> [www.commsupdate.com/articles/2019/04/26/ekip-publishes-report-on-4g-coverage-and-speed/](http://www.commsupdate.com/articles/2019/04/26/ekip-publishes-report-on-4g-coverage-and-speed/).

<sup>385</sup> ITU World Telecommunication/ICT Indicators Database online (2020), available at <http://handle.itu.int/11.1002/pub/81550f97-en> (indicator i271GA).

<sup>386</sup> [www.itu.int/en/ITU-D/Regional-Presence/Europe/Documents/Events/2019/Regulatory%20Forum/3.%20EKIP.pdf](http://www.itu.int/en/ITU-D/Regional-Presence/Europe/Documents/Events/2019/Regulatory%20Forum/3.%20EKIP.pdf).

<sup>387</sup> ITU World Telecommunication/ICT Indicators Database online (2021), available at <http://handle.itu.int/11.1002/pub/81550f97-en> (indicator i271G).

<sup>388</sup> ITU World Telecommunication/ICT Indicators Database online (2020), available at <http://handle.itu.int/11.1002/pub/81550f97-en> (indicator i136mwi).

<sup>389</sup> [www.itu.int/en/ITU-D/Regional-Presence/Europe/Documents/Events/2020/RRF/20-11-26%20Background%20Paper\\_Broadband%20Mapping%20Systems%20in%20Europe%20and%20Regional%20Harmonization%20Initiatives\\_final.pdf](http://www.itu.int/en/ITU-D/Regional-Presence/Europe/Documents/Events/2020/RRF/20-11-26%20Background%20Paper_Broadband%20Mapping%20Systems%20in%20Europe%20and%20Regional%20Harmonization%20Initiatives_final.pdf).

<sup>390</sup> [www.itu.int/en/ITU-D/Regional-Presence/Europe/Documents/Events/2019/Mapping%20Warsaw/ALEKSIC%20-%20EKIP%20-%20Montenegro%2028.06.2019.pdf](http://www.itu.int/en/ITU-D/Regional-Presence/Europe/Documents/Events/2019/Mapping%20Warsaw/ALEKSIC%20-%20EKIP%20-%20Montenegro%2028.06.2019.pdf).



(iii) accelerate next generation network development; (iv) increase investment; and (v) increase broadband access availability. The system consists of a georeferenced database, where EKIP collects data from operators through a web application based on the Esri ArcGIS server platform. Data are provided in shapefile format and kept in the Postgre SQL database run by EKIP. Moving forward, EKIP is taking steps to improve the georeferenced database and to align its regulatory framework with the best technical practices observed in the EU.<sup>391</sup>

### 3.5.2 Government strategies, status of education quality, and the role of ICTs

Montenegro has several strategies in the field of education: the Pre-school Education Strategy 2016-2020; the Vocational Education Strategy 2015-2020; the General Secondary Education Strategy 2015-2020; and the Strategy for Inclusive Education in Montenegro 2019-2025, among others. The Montenegrin Government is also preparing a draft strategy on lifelong entrepreneurial learning for 2020-2024, while primary and secondary schools are further involved in classes developing key competencies and basic skills, including socio-emotional learning, digital skills, critical thinking and problem-solving.<sup>392</sup> While these different strategies suggest a wide variety of tailored goals and targets depending on the educational level involved, the overall goals of the education system in Montenegro are to:<sup>393</sup>

- Provide opportunities for comprehensive individual development, regardless of sex, age, social and cultural background, national and religious affiliations and physical conditions;
- Meet the needs, interests, demands and ambitions of individuals for lifelong learning;
- Develop an awareness of the need to maintain and improve human rights, the rule of law, the natural and social environment, and multi-ethnic diversity, and the ability to do so;
- Develop an awareness of national affiliation to the Republic of Montenegro and its culture, traditions and history;
- Enable individuals' to take part in work and activities in line with their capacities;
- Facilitate the process of integration into Europe.

According to OECD PISA<sup>394</sup> results from the 2006-2009 period, Montenegrin students' scores for reading, mathematics and sciences were significantly below the OECD average.<sup>395</sup> Reading and mathematics performance in Montenegro has been increasing since the country first participated in PISA in 2006. However, the 2018 results showed limited improvement from 2015 and remain below the OECD average.<sup>396</sup> In reading, most of the improvement occurred in earlier cycles. The long-term change in reading performance shows one of the strongest increases among countries and economies that participate in PISA.<sup>397</sup> In mathematics, most of the improvement was observed over the most recent period, again with one of the greatest

<sup>391</sup> [www.itu.int/en/ITU-D/Regional-Presence/Europe/Documents/Events/2020/RRF/20-11-26%20Background%20Paper\\_Broadband%20Mapping%20Systems%20in%20Europe%20and%20Regional%20Harmonization%20Initiatives\\_final.pdf](http://www.itu.int/en/ITU-D/Regional-Presence/Europe/Documents/Events/2020/RRF/20-11-26%20Background%20Paper_Broadband%20Mapping%20Systems%20in%20Europe%20and%20Regional%20Harmonization%20Initiatives_final.pdf).

<sup>392</sup> [https://ec.europa.eu/neighbourhood-enlargement/sites/near/files/montenegro\\_report\\_2020.pdf](https://ec.europa.eu/neighbourhood-enlargement/sites/near/files/montenegro_report_2020.pdf).

<sup>393</sup> [www.ibe.unesco.org/sites/default/files/Montenegro.pdf](http://www.ibe.unesco.org/sites/default/files/Montenegro.pdf).

<sup>394</sup> PISA tests the reading, mathematics and science performance of 15-year-old pupils across the world every three years. In the context of the EU, PISA results are particularly important because they feed into the Education and Training 2020 strategic cooperation framework (ET2020). They form the basis for one of the ET2020 benchmarks: the rate of underachievers in reading, mathematics or science among 15-year-olds in the EU should be less than 15 per cent by 2020. Underachievers in PISA are those pupils who fail to reach the minimum proficiency level necessary to participate successfully in society. More information on the PISA indicators and ET2020 is available at [https://ec.europa.eu/education/sites/education/files/document-library-docs/pisa-2018-eu\\_1.pdf](https://ec.europa.eu/education/sites/education/files/document-library-docs/pisa-2018-eu_1.pdf).

<sup>395</sup> <https://files.eric.ed.gov/fulltext/EJ1130789.pdf>.

<sup>396</sup> [https://ec.europa.eu/neighbourhood-enlargement/sites/near/files/montenegro\\_report\\_2020.pdf](https://ec.europa.eu/neighbourhood-enlargement/sites/near/files/montenegro_report_2020.pdf).

<sup>397</sup> <https://gpseducation.oecd.org/CountryProfile?primaryCountry=MNE&treshold=10&topic=PI>.

increases among PISA-participating countries.<sup>398</sup> In 2018, science performance returned to 2006 levels after an initial slump.<sup>399</sup> These results show that reform efforts have so far produced significant positive effects when it comes to mathematics and literacy, but not science.<sup>400</sup>

Results also show that socio-economically advantaged students outperformed disadvantaged students in reading by 55 points in PISA 2018. This is less than the average difference between the two groups (89 points) across OECD countries.<sup>401</sup> Moreover, school principals in Montenegro reported fewer staff shortages and more shortages of materials than the OECD average, and school principals of disadvantaged schools more often reported staff shortages than principals of advantaged schools. In Montenegro, 5 per cent of students are enrolled in a disadvantaged school, and only 1.7 per cent of students attend schools whose principal reports that the school's capacity to provide instruction is hindered greatly or to some extent by a lack of teaching staff.<sup>402</sup> However, unlike in most other countries participating in the PISA study, the socio-economic status of students in Montenegro is correlated to a much lesser degree with their performance: only 5 per cent of all differences in performance can be accounted for by the socio-economic status of students. According to this indicator, Montenegro ranks among the European countries with very high equity in education.<sup>403</sup>

The content of the educational programme in Montenegro is aligned with, and the curriculum defined in accordance with, the General Education and Upbringing Act. Since the 2017-2018 academic year, primary schools have operated under a new set of courses and areas of focus. The main underpinning principles include the following: subject matter; a uniform syllabus structure for all levels of education; outcome-based teaching, together with means and criteria for evaluating outcomes; and cross-curricular linkages and topics. There are two kinds of subject goals: cognitive (the type of knowledge to be acquired) and process-related (the skills and values to be acquired). Potential subject goals are divided into four groups, relating to:<sup>404</sup>

- Cognitive skills: the ability to learn, problem-solving, critical thinking, creativity and innovation;
- ICT literacy: mastering information technologies and their application in solving different types of problems;
- Social and emotional skills: self-awareness and self-regulation, establishing and maintaining good interpersonal relations (communication, collaboration, conflict resolution, etc.);
- Responsible attitude to oneself and the environment: health, environment, civic education, career education (entrepreneurship).

However, the revised curriculum does not specify how these goals are to be implemented in teaching/learning.

Through the development of the Montenegrin Education Information System (MEIS),<sup>405</sup> the Government of Montenegro has been collecting relevant data on education and schools. MEIS was adopted in 2004 and has since received government recognition as a basic component for using ICTs in the educational system.<sup>406</sup> This recognition is due to the MEIS project objective of

<sup>398</sup> [www.oecd.org/pisa/publications/PISA2018\\_CN\\_MNE.pdf](http://www.oecd.org/pisa/publications/PISA2018_CN_MNE.pdf).

<sup>399</sup> [www.oecd.org/pisa/publications/PISA2018\\_CN\\_MNE.pdf](http://www.oecd.org/pisa/publications/PISA2018_CN_MNE.pdf).

<sup>400</sup> [www.unicef.org/montenegro/media/8686/file/MNE-media-MNEpublication501.pdf](http://www.unicef.org/montenegro/media/8686/file/MNE-media-MNEpublication501.pdf).

<sup>401</sup> [www.oecd.org/pisa/publications/PISA2018\\_CN\\_MNE.pdf](http://www.oecd.org/pisa/publications/PISA2018_CN_MNE.pdf).

<sup>402</sup> <https://gpseducation.oecd.org/CountryProfile?primaryCountry=MNE&treshold=10&topic=PI>.

<sup>403</sup> [www.unicef.org/montenegro/media/8686/file/MNE-media-MNEpublication501.pdf](http://www.unicef.org/montenegro/media/8686/file/MNE-media-MNEpublication501.pdf).

<sup>404</sup> [www.unicef.org/montenegro/media/8686/file/MNE-media-MNEpublication501.pdf](http://www.unicef.org/montenegro/media/8686/file/MNE-media-MNEpublication501.pdf).

<sup>405</sup> [www.meisportal.edu.me/meisindex/faces/index.jspx](http://www.meisportal.edu.me/meisindex/faces/index.jspx).

<sup>406</sup> For more information please consult <https://mps.gov.me/en/>.

providing ICT equipment and broadband to all Montenegrin schools to implement ICT-based training programmes for children, educators and other staff.<sup>407</sup> In 2017, MEIS was upgraded to enable the establishment of an early warning system for identifying students who are at risk of dropping out and recording actions taken by teachers, school support services and principals to address this risk. Along with this, initial steps were taken to upgrade MEIS to produce school profile cards, i.e. feedback to schools and the general public in the format of user-friendly and relevant data. Both the early warning system and the school profile cards were piloted in 20 schools in 2018<sup>408</sup> and scaled up to all primary and secondary schools in Montenegro.

As a result, data from ICT surveys and information on the circumstances of different schools across diverse geographical contexts have enabled a picture to emerge of the state of schools, not only in terms of their student bodies and staff, but also their infrastructure.<sup>409</sup> Additionally, MEIS also helps to define the necessary resources, specific methods and technologies for the use of modern ICTs in education. Consequently, basic country-wide data on education is openly available via the portal of the Statistical Office of Montenegro.<sup>410</sup>

Additionally, thanks to the cooperation of UNICEF and Telenor, Montenegro has become the first country to have comparable data on the digital skills of children, parents and teachers within the Global Kids Online research network, which is being implemented by UNICEF and the London School of Economics and Political Science. In the face of the COVID-19 pandemic, UNICEF is also providing support to ensure the sustainability of MEIS, making the system suitable for online enrolment and other relevant processes.<sup>411</sup>

In terms of ICT access, Montenegro's Information Society Development Strategy 2016-2020 indicates that there was one computer for every 16 students at primary school level and one computer for every 14 students at secondary school level in 2016. OECD data from 2015 give a ratio of 1:5; for students aged 15, more recent OECD data indicate that only one computer is available at school for every four Montenegrin students.<sup>412</sup> Particularly in the context of rural schools and disadvantaged communities, these indicators present even more inequalities. Regarding data, however, these differences also suggest that both the methodologies adopted and the relationship between national and international methodologies must be clarified, in order to make effective, evidence-based policy decisions.<sup>413</sup>

In terms of Internet speed, the average was 4 Mbit/s for fixed connectivity and 8 Mbit/s for satellite-enabled Internet connections. The proportion of teachers in Montenegro trained in basic IT skills stood at around 20 per cent.<sup>414</sup>

In 2019, the Ministry of Education, Science, Culture and Sports launched a scholarship programme for Roma and Egyptian<sup>415</sup> high-school and university students. Despite increased

<sup>407</sup> Dejian Liu and others (eds.), *Comparative Analysis of ICT in Education Between China and Central and Eastern European Countries* (Springer, 2020), available at <https://doi.org/10.1007/978-981-15-6879-4>.

<sup>408</sup> [www.unicef.org/about/annualreport/files/Montenegro\\_2017\\_COAR.pdf](http://www.unicef.org/about/annualreport/files/Montenegro_2017_COAR.pdf).

<sup>409</sup> <https://rm.coe.int/8th-national-report-of-montenegro/168094e38e>.

<sup>410</sup> [www.monstat.org/eng/page.php?id=74&pageid=74](http://www.monstat.org/eng/page.php?id=74&pageid=74).

<sup>411</sup> <https://montenegro.un.org/en/45932-supporting-education-system-cope-covid-19>.

<sup>412</sup> [www.hm.ee/sites/default/files/framework\\_guide\\_v1\\_002\\_harward.pdf](http://www.hm.ee/sites/default/files/framework_guide_v1_002_harward.pdf).

<sup>413</sup> [https://gpseducation.oecd.org/IndicatorExplorer?plotter=h5&query=34&indicators=N051\\*N055\\*N160\\*S016\\*S017\\*S018\\*N052\\*N056\\*N057\\*R001\\*R005\\*N037\\*N038\\*N039\\*N040\\*N041\\*N042\\*T012\\*T013\\*C076\\*P005\\*P006\\*N050\\*T037\\*A256\\*A258\\*A263\\*A264\\*A265\\*P819\\*N122\\*N123\\*N236\\*N237\\*N238\\*N239](https://gpseducation.oecd.org/IndicatorExplorer?plotter=h5&query=34&indicators=N051*N055*N160*S016*S017*S018*N052*N056*N057*R001*R005*N037*N038*N039*N040*N041*N042*T012*T013*C076*P005*P006*N050*T037*A256*A258*A263*A264*A265*P819*N122*N123*N236*N237*N238*N239).

<sup>414</sup> [https://mid.gov.me/ResourceManager/FileDownload.aspx?rid=251855&rType=2&file=StrategijaMID\\_finalENG.pdf](https://mid.gov.me/ResourceManager/FileDownload.aspx?rid=251855&rType=2&file=StrategijaMID_finalENG.pdf).

<sup>415</sup> [www.unicef.org/montenegro/media/2976/file/MNE-media-MNEpublication44.pdf](http://www.unicef.org/montenegro/media/2976/file/MNE-media-MNEpublication44.pdf).

attendance rates and fewer cases of dropout observed since 2016, the overall number of Roma and Egyptian children, and children with disabilities, who attend school remains low; most worrying is the low numbers of Roma and Egyptian children completing compulsory education.<sup>416</sup>

While the Information Society Development Strategy recommends the use of digital and online methods in education to diversify knowledge acquisition and develop students' digital skills, the inequalities surrounding access to ICTs have also been exacerbated in the context of the COVID-19 pandemic.

### 3.5.3 Multistakeholder partnerships and financing mechanisms fostering investment in school connectivity

Montenegro's Information Society Development Strategy 2016-2020 encompasses three major components: infrastructure, cybersecurity; and the e-economy, which involves e-business, e-inclusion, e-government and research, and innovation and development in the field of ICT. In line with the Digital Agenda for Europe, one of the strategic priorities for ICT and broadband development in Montenegro includes the provision of e-education. In particular, the Strategy envisages that the computer-student ratio should be 1:10 by 2020.<sup>417</sup> The Strategy indicators also show that Montenegro plans to provide 100 per cent Internet coverage in regional school units at a minimum fixed Internet speed of 20 Mbit/s by 2020.<sup>418</sup>

At the 20<sup>th</sup> meeting of the Management Board of the Western Balkans Investment Framework, held in June 2019, the EU awarded Montenegro EUR 600 000 to fund the Broadband Infrastructure Development in Montenegro (PRJ-MNE-DII-001) project, which is currently being implemented.<sup>419</sup> Based on a complete infrastructure mapping process, the goal of this project is to analyse the current situation and examine the potential of the market to eliminate existing infrastructure gaps. There are three expected results and benefits:<sup>420</sup>

- Increasing broadband coverage and the availability of new generation broadband networks to the (mostly rural) areas in Montenegro not currently covered;
- Offering adequate infrastructure for fast and secure Internet to all households, businesses, and educational and health institutions in order to support the digital transformation of society and the economy;
- Increasing the percentage of households equipped with next generation access networks from 70 to 95 per cent.

Furthermore, initiatives with private and third-sector stakeholders focused on Internet provision to schools have also been under way in Montenegro. Since 2007,<sup>421</sup> telecommunication operator Crnogorski Telekom has provided free broadband Internet to about 250 primary and secondary schools in Montenegro, as well as pre-school institutions in the country.<sup>422</sup> In 2017, strategic cooperation with the Ministry of Education, Science, Culture and Sports was renewed, and an

<sup>416</sup> [https://ec.europa.eu/neighbourhood-enlargement/sites/near/files/montenegro\\_report\\_2020.pdf](https://ec.europa.eu/neighbourhood-enlargement/sites/near/files/montenegro_report_2020.pdf).

<sup>417</sup> [https://mid.gov.me/ResourceManager/Download.aspx?rid=251855&rType=2&file=StrategijaMID\\_finalENG.pdf](https://mid.gov.me/ResourceManager/Download.aspx?rid=251855&rType=2&file=StrategijaMID_finalENG.pdf).

<sup>418</sup> [https://mid.gov.me/ResourceManager/Download.aspx?rid=251855&rType=2&file=StrategijaMID\\_finalENG.pdf](https://mid.gov.me/ResourceManager/Download.aspx?rid=251855&rType=2&file=StrategijaMID_finalENG.pdf).

<sup>419</sup> <https://balkan.eu/eur-600-000-for-the-montenegro-digital-infrastructure-sector/>.

<sup>420</sup> <https://wbif.eu/project/PRJ-MNE-DII-001>.

<sup>421</sup> [www.telekom.hu/static-tr/sw/file/Sustainability\\_report\\_2010.pdf](http://www.telekom.hu/static-tr/sw/file/Sustainability_report_2010.pdf).

<sup>422</sup> <https://cordmagazine.com/interview/dina-tsybulskaya-crnogorski-telekom-smart-solutions-for-montenegro/>

agreement was signed to enable educational institutions with the technical capabilities to use optical transmission services and TurboDSL, which will provide schools with increased service stability and higher rates of data flow. The value of services donated during 2017 was EUR 71 000.<sup>423</sup> In June 2019, the operator partnered with the Ministry to expand Internet coverage to about 150 regional schools. The project will be implemented in the 2019-2021 period and will provide these educational institutions with free access to 4G mobile Internet.<sup>424</sup>

### 3.5.4 National responses to COVID-19 and educational initiatives for distance learning

With the closure of schools in response to COVID-19, 118 000 students have been directly affected in Montenegro. In March, the Ministry of Education, Science, Culture and Sports started applying the new concept of distance learning through the #UčiDoma (#StudyAtHome) portal.<sup>425</sup> This project includes recording and broadcasting lectures covering the national curriculum. About 1 700 lectures were recorded and a number of schools started to take part in the project. Primary school content was broadcast on the YouTube channel #UčiDoma<sup>426</sup> and a platform for the programme<sup>427</sup> developed by Amplitudo;<sup>428</sup> it was also made available via a mobile app. Lectures were recorded and broadcast in the Albanian language as well. Lessons have also been broadcast via three TV channels—TVCG 2, MNE Sport and MNE Sport 2, now called “study-at-home channels”.<sup>429</sup> According to a survey conducted in late March 2020 by Ipsos, with the support of UNICEF, over two-thirds of citizens had watched the #UčiDoma television channel at least once in the previous week.<sup>430</sup>

While continuity of education was maintained by the Ministry of Education, Science, Culture and Sports via television and the Internet, the distance learning system was not accessible to all children in the country. For communities that lack reliable Internet access, other partnerships with private stakeholders are being considered, including a potential agreement with telecom operators to provide unlimited data plans for those students least likely to have reliable broadband access.<sup>431</sup> Data from a 2020 United Nations rapid social impact assessment, collected first in April and again in June, highlighted that a significant percentage of households in Montenegro with children and adolescents of school age did not have computers/laptops (21 per cent) or tablets (51 per cent) connected to the Internet that could be used for distance learning.<sup>432</sup> To provide support to certain families, the Government announced a decision entitling one of the parents of a child under the age of 11 and one of the parents of children with special educational needs to paid leave benefits.<sup>433</sup>

<sup>423</sup> <http://investedinmontenegro.me/portfolio-item/Internet-for-better-education/>.

<sup>424</sup> [www.telecompaper.com/news/crnogorski-telekom-expands-Internet-coverage-in-schools--1298566](http://www.telecompaper.com/news/crnogorski-telekom-expands-Internet-coverage-in-schools--1298566).

<sup>425</sup> <https://www.wb6cif.eu/wp-content/uploads/2020/05/Covid-19-response-in-MNE-27.4.pdf>.

<sup>426</sup> [www.ebrd.com/news/2020/learning-from-home-in-montenegro.html](http://www.ebrd.com/news/2020/learning-from-home-in-montenegro.html).

<sup>427</sup> [www.ucidoma.me/](http://www.ucidoma.me/).

<sup>428</sup> <https://amplitudo.me/blog/ucidoma-distance-learning>.

<sup>429</sup> <https://m.cdm.me/english/new-distance-learning-concept-in-montenegro-starts-today/>.

<sup>430</sup> [www.unicef.org/montenegro/en/stories/distance-learning-developing-childrens-digital-literacy-during-covid-19-crisis](http://www.unicef.org/montenegro/en/stories/distance-learning-developing-childrens-digital-literacy-during-covid-19-crisis).

<sup>431</sup> <http://documents1.worldbank.org/curated/en/590751590682058272/pdf/The-Economic-and-Social-Impact-of-COVID-19-Education.pdf>.

<sup>432</sup> [https://reliefweb.int/sites/reliefweb.int/files/resources/MNE\\_Socioeconomic-Response-Plan\\_2020.pdf](https://reliefweb.int/sites/reliefweb.int/files/resources/MNE_Socioeconomic-Response-Plan_2020.pdf).

<sup>433</sup> [www.oecd.org/south-east-europe/COVID-19-Crisis-in-Montenegro.pdf](http://www.oecd.org/south-east-europe/COVID-19-Crisis-in-Montenegro.pdf).

The United Nations in Montenegro has worked with partners to support access to continuous education services in response to the COVID-19 pandemic. The United Nations has been particularly active at the country level in this regard, taking action in the following areas:<sup>434</sup>

- Distribution of paper-based learning materials for Roma and Egyptian children who do not have access to distance learning channels;
- Distribution of tablets to Roma children, children with disabilities, children in foster care and others unable to access online learning owing to a lack of devices;
- Extending the partnership with Special Olympics Montenegro to enable children with intellectual disabilities and families to implement the Young Athletes early childhood education programme at home through the distribution of equipment and development of video tutorials;
- Enhancing and consolidating EMIS-based services, including for online enrolment, and supporting the development, in cooperation with the Ministry of Education, Science, Culture and Sports, of EMIS-based modules for monitoring school-based support during COVID-19, mapping needs and establishing guidance for further development of the digital education system;
- Capacity-building for teachers to use digital tools in a high-quality and effective manner in everyday teaching, along with capacity-building, in cooperation with the Ministry of Education, Science, Culture and Sports, for pre-school teachers to support learning for Roma children;
- Developing a platform for online learning and collaboration, in cooperation with UNICEF Headquarters, the University of Cambridge and Microsoft;
- Establishing and equipping an IT laboratory at the Centre for Children in Conflict with the Law to enable children residing at the institution to acquire digital skills and facilitate distance learning;
- Supporting children and adolescents with learning difficulties through the Study Buddy peer-learning programme led by the UNICEF Youth Innovation Lab, in partnership with associations of young people with disabilities;
- Online safety programmes for adolescents through non-formal education; and
- A partnership between the Ministry of Education, Science, Culture and Sports, the Ministry of Public Administration and UNDP, culminating in the creation of a new electronic enrolment system for safe and timely enrolment in primary school and kindergarten for the coming school year.<sup>435</sup>

COVID-19 has highlighted the need to create an inclusive digital education system in Montenegro that improves not only the education sector's resilience to crises but also the quality, inclusiveness and relevance of learning. In 2020, UNICEF reached an agreement with the Ministry of Education, Science, Culture and Sports in this regard to develop a high-quality inclusive digital learning system. With UNICEF as the United Nations implementing agency, one of the outputs of this cooperation is the anticipated launch of a centralized, interactive platform for online teaching, learning and collaboration, as well as the creation of a high-quality, inclusive digital curriculum and teacher training for high-quality, inclusive instruction and learning through digital tools, with an approximate cost of USD 350 000 and an implementation time-frame of 18 months from the start of the pandemic. The pilot platform will be based on the global Learning Passport partnership between UNICEF, Microsoft and the University of Cambridge and aims to cover all education levels up to tertiary education, including non-formal education and professional development for teachers.<sup>436</sup> Moreover, it will be critical to ensure

<sup>434</sup> [https://reliefweb.int/sites/reliefweb.int/files/resources/MNE\\_Socioeconomic-Response-Plan\\_2020.pdf](https://reliefweb.int/sites/reliefweb.int/files/resources/MNE_Socioeconomic-Response-Plan_2020.pdf).

<sup>435</sup> <https://montenegro.un.org/en/46007-supporting-education-system-cope-covid-19>.

<sup>436</sup> [www.unicef.org/media/93756/file/ECAR%20COVID-19%20Situation%20Report%20No.%2016%20End%20of%20year%202020.pdf](http://www.unicef.org/media/93756/file/ECAR%20COVID-19%20Situation%20Report%20No.%2016%20End%20of%20year%202020.pdf).

that tailored and targeted support and equipment are available for the most vulnerable children, particularly Roma and refugee children, children with disabilities, those affected by poverty, and children living in residential care to bridge both the digital divide and learning gaps that disproportionately affect these vulnerable children.

In June 2020, the Ministry of Education, Science, Culture and Sports and UNICEF co-hosted an education sector coordination meeting to bring together a wide range of bilateral and international partners to ensure a targeted, inclusive response to children's educational needs and a smooth transition from recovery to normalization.<sup>437</sup> Actions by UNICEF also included the digitalization of non-formal education and skills-building platforms for adolescents and youth, including UPSHIFT, skills-building workshops and programmes for mental health. UNICEF is also undertaking an education sector analysis, which will consider the impact of the COVID-19 crisis on the education system to ensure long-term responsiveness to risks through high-quality planning and the sustained financing of reforms.<sup>438</sup> Teacher training to equip teachers with ICT and digital skills is also under way,<sup>439</sup> and by the end of 2020, UNICEF had supported training for 4 500 teachers in Montenegro in delivering distance learning, as well as large-scale capacity-strengthening workshops for teachers and school staff on using Office 365 tools for teaching and collaboration.<sup>440</sup>

In a UNICEF survey of a nationally representative sample consisting of 1 037 parents of school-age children in Montenegro, data showed that as many as 80 per cent of parents were satisfied with the support that they and their children received from schools during the distance learning period induced by COVID-19. Most of them (86 per cent) were satisfied with communication and cooperation with teachers during this period. However, most parents thought that, in the long run, distance learning could lead to a decline in children's motivation to learn.<sup>441</sup> More recent surveys indicate an evolving sentiment toward distance education, with three-fifths of parents surveyed indicating a negative opinion about the learning model.<sup>442</sup> Parents of Roma and refugee children, as well as those of children with disabilities and children affected by poverty, point to the need for greater support, primarily in terms of ensuring access to new technologies and the Internet, as well as to the skills to use digital tools effectively during online classes.<sup>443</sup>

In July 2020, the Ministry of Education, Science, Culture and Sports, with support from UNDP and UNICEF in Montenegro, developed an electronic platform for enrolment in kindergartens, primary schools and secondary schools. Through this e-platform, schools will be able to offer parents online enrolment procedures in a safer, simpler and faster way.<sup>444</sup> UNDP anchors this initiative through its work with the Ministry of Public Administration, supported by the EU, to establish electronic services for citizens and develop a national system for data exchange

<sup>437</sup> [www.unicef.org/eca/media/12581/file](http://www.unicef.org/eca/media/12581/file).

<sup>438</sup> [https://reliefweb.int/sites/reliefweb.int/files/resources/MNE\\_Socioeconomic-Response-Plan\\_2020.pdf](https://reliefweb.int/sites/reliefweb.int/files/resources/MNE_Socioeconomic-Response-Plan_2020.pdf).

<sup>439</sup> [www.unicef.org/montenegro/en/stories/distance-learning-developing-childrens-digital-literacy-during-covid-19-crisis](http://www.unicef.org/montenegro/en/stories/distance-learning-developing-childrens-digital-literacy-during-covid-19-crisis).

<sup>440</sup> UNICEF COVID-19 response in education questionnaire, September 2020; updated data on number of teachers provided by UNICEF Montenegro Country Office.

<sup>441</sup> [www.unicef.org/montenegro/en/stories/we-will-support-overcoming-challenges-education-during-covid-19-pandemic](http://www.unicef.org/montenegro/en/stories/we-will-support-overcoming-challenges-education-during-covid-19-pandemic).

<sup>442</sup> [www.unicef.org/montenegro/media/15891/file/mne-media-1001.publication.pdf](http://www.unicef.org/montenegro/media/15891/file/mne-media-1001.publication.pdf).

<sup>443</sup> [www.unicef.org/montenegro/en/stories/parents-are-concerned-supportive-school-reopening](http://www.unicef.org/montenegro/en/stories/parents-are-concerned-supportive-school-reopening).

<sup>444</sup> <https://unsdg.un.org/latest/stories/supporting-education-system-cope-covid-19-montenegro>.

among state registers.<sup>445</sup> Additionally, a new portal, eDnevnikMNE, was developed for parents, containing information on students' grades and behaviour.<sup>446</sup>

Prioritization the return to school in this manner is essential, especially for the most marginalized children and adolescents. As a result of the disruption to learning, Roma and Egyptian children are more likely to drop out and less likely to enrol or return to school. UNICEF support, aimed at raising the awareness of Roma and Egyptian parents about the importance of early education, early stimulation, and water, sanitation and hygiene has been tailored to the crisis and the constraints it imposes, including through the distribution of educational brochures in Montenegrin and Albanian and follow-up, one-on-one telephone sessions for parents with professionals from the NGO Pedagogical Centre about how to support learners at home.<sup>447</sup>

In October 2020, the Ministry of Education, Science, Culture and Sports announced that students from the first to sixth grades of primary school and the first grade of secondary school (ages 6 to 13 and 15 to 16) would resume in-person classes. Students in other age groups will continue online learning, with in-person consultations at school every 15 days.<sup>448</sup> These decisions are supported by the launch of a COVID-19 webpage within the skolskostatistika.edu.me portal to enable regular data collection on the number of infected children, students and school staff at municipal level. Data are collected on a weekly basis for each level of education, ensuring regular and transparent monitoring of the situation in schools.<sup>449</sup> Meanwhile, UNICEF has been supporting the Government's efforts to ensure re-enrolment of the most marginalized children, such as by identifying those most at risk of not returning, providing outreach to families and the children and adolescents who do not return, monitoring re-enrolment and attendance, and supporting the organization of designated catch-up efforts for those who have fallen the farthest behind.<sup>450</sup>

## 3.6 North Macedonia

### 3.6.1 Overview of the education system and status of broadband

The basic principles of the national education system in North Macedonia are set out in Articles 44 to 48 of its Constitution, which stipulates that all individuals are entitled to education and that education shall be accessible to all on equal terms.<sup>451</sup> The Primary Education Act specifies that all children from 6 to 15 years of age shall attend school for a compulsory nine years. The High School Education Act specifies that all adolescents from the ages of 15 to 19 must attend high school for four years (or three years, depending on the type of school).<sup>452</sup> Since the early 2000s, North Macedonia has improved access to education, and steps to promote inclusiveness in the country have been taken by the Government. Moreover, significant efforts have been made since 2010 to improve education in the country.<sup>453</sup> Reforms to the school curriculum have

<sup>445</sup> <https://montenegro.un.org/en/45932-supporting-education-system-cope-covid-19>.

<sup>446</sup> [https://eacea.ec.europa.eu/national-policies/eurydice/content/national-reforms-school-education-45\\_en](https://eacea.ec.europa.eu/national-policies/eurydice/content/national-reforms-school-education-45_en).

<sup>447</sup> [www.unicef.org/media/82906/file/ECARO-COVID19-SitRep-26-August-2020.pdf](http://www.unicef.org/media/82906/file/ECARO-COVID19-SitRep-26-August-2020.pdf).

<sup>448</sup> <https://balkaninsight.com/2020/09/29/montenegro-north-macedonia-launch-school-year-amid-covid-19-worries/>.

<sup>449</sup> [www.unicef.org/media/93756/file/ECAR%20COVID-19%20Situation%20Report%20No.%2016%20End%20of%20year%202020.pdf](http://www.unicef.org/media/93756/file/ECAR%20COVID-19%20Situation%20Report%20No.%2016%20End%20of%20year%202020.pdf).

<sup>450</sup> UNICEF Europe and Central Asia Region COVID-19 response in education questionnaire, September 2020.

<sup>451</sup> [www.ilo.org/dyn/natlex/docs/ELECTRONIC/36714/70972/F511737559/MKD36714%20Eng.pdf](http://www.ilo.org/dyn/natlex/docs/ELECTRONIC/36714/70972/F511737559/MKD36714%20Eng.pdf).

<sup>452</sup> [https://eacea.ec.europa.eu/national-policies/eurydice/content/former-yugoslav-republic-macedonia\\_en](https://eacea.ec.europa.eu/national-policies/eurydice/content/former-yugoslav-republic-macedonia_en).

<sup>453</sup> [www.worldbank.org/en/news/press-release/2020/09/16/north-macedonia-needs-to-continue-investing-in-education-and-health-in-order-to-improve-its-human-capital](http://www.worldbank.org/en/news/press-release/2020/09/16/north-macedonia-needs-to-continue-investing-in-education-and-health-in-order-to-improve-its-human-capital).



been occurring since the 2014-2015 academic year, and new incentives have been put in place to modernize the current traditional teaching and learning methods and to introduce a more interactive approach into the education process.<sup>454</sup>

In terms of organization, the Macedonian education system is decentralized, with the State providing financial resources for education in each municipality in the form of block grants. At the policy level, the Ministry of Education and Science is responsible for developing strategic and legal documents and defining and implementing policies for all levels of education except pre-primary, for which responsibility is shared with the Ministry of Labour and Social Policy.<sup>455</sup>

According to data for the 2019-2020 academic year from the State Statistical Office of Macedonia, there are 1 119 schools in North Macedonia: 987 institutions for primary education and 132 institutions for secondary education.<sup>456</sup> These schools have 265 003 students – 109 818 in primary education and 155 185 in secondary.<sup>457</sup> Some 18 272 teachers are working in regular elementary schools and 7 479 in secondary schools.<sup>458</sup> As reported by the European Commission, government investment in early childhood education and care increased, and 1 284 additional public pre-school places were made available in 2019. However, the overall level of enrolment remains low. Whereas the ET2020 target for early childhood education and care attendance is set at 95 per cent, only 40.2 per cent of children from 3 to 6 years of age in North Macedonia were enrolled in licensed early childhood education and care institutions in the 2019-2020 school year.<sup>459</sup>

The completion rate for children of primary school age was 98.3 per cent in 2019.<sup>460</sup> However, the completion rate for young people in upper secondary education was 74.4 per cent in the same year.<sup>461</sup> According to MICS 2019 survey data, the rates were to 94 per cent and 87.4 per cent respectively.<sup>462</sup> These patterns are also visible in out-of-school rates for the country, which are below 1 per cent for primary-age children but rise to 7.2 per cent for children of lower secondary age. MICS survey data show slightly higher 2019 out-of-school rates, at 1.7 per cent for children of primary school age and 8.4 per cent for children and adolescents of lower secondary age.<sup>463</sup> Moreover, after the Republic of Moldova, North Macedonia has the second highest out-of-school rates at the upper secondary level, at 31.5 per cent, although this figure is from 2007 and therefore outdated.<sup>464</sup> Using these data, just under 52 000 children and adolescents were out of school in North Macedonia, though again, caution must be exercised in interpreting these outdated figures; priority must be therefore given to collecting accurate and up-to-date data. MICS survey data from 2019 do indicate an improvement in out-of-school rates for adolescents and youth of upper secondary school age, with 8.4 per cent being out of school

<sup>454</sup> [https://eacea.ec.europa.eu/national-policies/eurydice/content/former-yugoslav-republic-macedonia\\_en](https://eacea.ec.europa.eu/national-policies/eurydice/content/former-yugoslav-republic-macedonia_en).  
<sup>455</sup> [www.oecd-ilibrary.org/docserver/9b99696c-en.pdf?expires=1606760219&id=id&accname=guest&checksum=CD1B54F5745838006C39B0D09F7B9FAC](http://www.oecd-ilibrary.org/docserver/9b99696c-en.pdf?expires=1606760219&id=id&accname=guest&checksum=CD1B54F5745838006C39B0D09F7B9FAC).

<sup>456</sup> [https://ec.europa.eu/neighbourhood-enlargement/sites/near/files/north\\_macedonia\\_report\\_2020.pdf](https://ec.europa.eu/neighbourhood-enlargement/sites/near/files/north_macedonia_report_2020.pdf).

<sup>457</sup> <http://data.uis.unesco.org/#> (indicators: enrolment in primary education, both sexes; enrolment in secondary education, both sexes).

<sup>458</sup> [www.stat.gov.mk/OblastOpsto\\_en.aspx?id=5](http://www.stat.gov.mk/OblastOpsto_en.aspx?id=5).

<sup>459</sup> [https://ec.europa.eu/neighbourhood-enlargement/sites/near/files/north\\_macedonia\\_report\\_2020.pdf](https://ec.europa.eu/neighbourhood-enlargement/sites/near/files/north_macedonia_report_2020.pdf).

<sup>460</sup> [https://data.unicef.org/resources/data\\_explorer/unicef\\_f?ag=UNICEF&df=GLOBAL\\_DATAFLOW&ver=1.0&dq=MKD.ED\\_CR\\_L1+ED\\_CR\\_L3+ED\\_ANAR\\_L3+ED\\_15-24\\_LR.&startPeriod=2011&endPeriod=2020](https://data.unicef.org/resources/data_explorer/unicef_f?ag=UNICEF&df=GLOBAL_DATAFLOW&ver=1.0&dq=MKD.ED_CR_L1+ED_CR_L3+ED_ANAR_L3+ED_15-24_LR.&startPeriod=2011&endPeriod=2020).

<sup>461</sup> [https://data.unicef.org/resources/data\\_explorer/unicef\\_f?ag=UNICEF&df=GLOBAL\\_DATAFLOW&ver=1.0&dq=MKD.ED\\_CR\\_L1+ED\\_CR\\_L3+ED\\_ANAR\\_L3+ED\\_15-24\\_LR.&startPeriod=2011&endPeriod=2020](https://data.unicef.org/resources/data_explorer/unicef_f?ag=UNICEF&df=GLOBAL_DATAFLOW&ver=1.0&dq=MKD.ED_CR_L1+ED_CR_L3+ED_ANAR_L3+ED_15-24_LR.&startPeriod=2011&endPeriod=2020).

<sup>462</sup> [www.stat.gov.mk/Dokumenti/MICS\\_18-19.pdf](http://www.stat.gov.mk/Dokumenti/MICS_18-19.pdf); information provided by North Macedonia's Ministry of Education and Science.

<sup>463</sup> [https://www.stat.gov.mk/Dokumenti/MICS\\_18-19.pdf](https://www.stat.gov.mk/Dokumenti/MICS_18-19.pdf); information provided by North Macedonia's Ministry of Education and Science.

<sup>464</sup> According to the most recent available UIS data on out-of-school totals and rates.

in 2019, and the Ministry of Education and Science of North Macedonia therefore estimating a total of 11 528 out-of-school students in 2019.<sup>465</sup> In terms of learning quality, UNESCO data show that the literacy rate for the 15-24 years age group in North Macedonia was 98.6 per cent in 2014. Nonetheless, North Macedonia has the highest percentage among the nine countries in this study of students who do not achieve minimum proficiency in foundational skills. This is true for 59.5 per cent of enrolled students, and even higher (61 per cent) among secondary-age students, amounting to more than 542 000 children and adolescents who, despite being in school, are out of learning.<sup>466</sup>

To bridge these learning and skills gaps, a recent priority of North Macedonia has been adult education, an activity which is regulated by the Adult Education Act and the Vocational Education Act.<sup>467</sup> The most recent data show that the country's public spending on education and training was 3.7 per cent of GDP in 2019, while the EU average for 2017 was 4.7 per cent.<sup>468</sup> Between 2011 and 2016, North Macedonia's public spending on education as a percentage of GDP fell from 4.6 per cent to 3.7 per cent. The share of total government expenditure allocated to education also declined from 13.3 per cent to 11.6 per cent, falling below the United Nations benchmark of 15-20 per cent.<sup>469</sup>

Concerning broadband development in the country, ITU data indicate that 81.4 per cent of individuals in North Macedonia used the Internet in 2020.<sup>470</sup> In the same year, the number of fixed-broadband subscriptions per 100 inhabitants was 22.2.<sup>471</sup> Moreover, the latest report by the Broadband Competence Office<sup>472</sup> on the country's broadband development gives the following figures:

- Fixed-broadband coverage (% of households) – 97.97 per cent;
- Fixed-broadband take-up (% of households) – 72.9 per cent;
- 4G coverage (% of households) – 99.4 per cent;
- Preparedness for 5G (% of harmonized spectrum) – 22.2 per cent;
- Fast broadband (NGA) coverage (% of households) – 78 per cent;
- Fast broadband take-up (% of households) – 27.4 per cent;
- Ultra-fast broadband (NGA) coverage (% of households) – 43.8 per cent;
- Ultra-fast broadband take-up (% of households) – 1.7 per cent.

Detailed information in the National Operational Broadband Plan for 2019-2029 shows that coverage with fast broadband networks is roughly the same as the average in the European Union. However, the existing coverage with ultra-fast broadband networks (43.8 per cent) is lower than the EU average (58 per cent).<sup>473</sup> Among enterprises with 10 or more employees in

<sup>465</sup> See: [https://www.stat.gov.mk/Dokumenti/MICS\\_18-19.pdf](https://www.stat.gov.mk/Dokumenti/MICS_18-19.pdf); information provided by North Macedonia's Ministry of Education and Science.

<sup>466</sup> UNICEF calculation of the number of students in primary, lower secondary and upper secondary not achieving minimum proficiency in mathematics; data for North Macedonia are based on the latest available figures from UIS and PISA (<http://uis.unesco.org/en/country/mk>).

<sup>467</sup> [https://eacea.ec.europa.eu/national-policies/eurydice/content/former-yugoslav-republic-macedonia\\_en](https://eacea.ec.europa.eu/national-policies/eurydice/content/former-yugoslav-republic-macedonia_en).

<sup>468</sup> <https://data.worldbank.org/indicator/SE.XPD.SECO.PC.ZS?locations=EU>.

<sup>469</sup> [www.oecd-ilibrary.org/docserver/9b99696c-en.pdf?expires=1606760219&id=id&accname=guest&checksum=CD1B54F5745838006C39B0D09F7B9FAC](http://www.oecd-ilibrary.org/docserver/9b99696c-en.pdf?expires=1606760219&id=id&accname=guest&checksum=CD1B54F5745838006C39B0D09F7B9FAC).

<sup>470</sup> ITU World Telecommunication/ICT Indicators Database online (2021), available at <http://handle.itu.int/11.1002/pub/81550f97-en> (indicator i99H).

<sup>471</sup> ITU World Telecommunication/ICT Indicators Database online (2021), available at <http://handle.itu.int/11.1002/pub/81550f97-en> (indicator i992b).

<sup>472</sup> <http://bco.mioa.gov.mk/wp-content/uploads/2020/10/-----2-----29.9.2020-eng.pdf>.

<sup>473</sup> [https://mioa.gov.mk/sites/default/files/pbl\\_files/documents/reports/north\\_macedonia\\_national\\_operational\\_broadband\\_plan\\_final\\_en.pdf](https://mioa.gov.mk/sites/default/files/pbl_files/documents/reports/north_macedonia_national_operational_broadband_plan_final_en.pdf).

2019, 85.8 per cent had a fixed-broadband connection, an increase of 4.3 percentage points compared to the previous year.<sup>474</sup> Additionally, the wholesale broadband market in North Macedonia is highly concentrated, with few providers, and high wholesale broadband prices prevent investment, especially among the smaller or regional operators.<sup>475</sup>

Concerning the mobile sector, mobile-broadband subscriptions per 100 inhabitants stood at 64.73 in 2020.<sup>476</sup> Moreover, according to ITU data, 3G population coverage in North Macedonia was 99.88 per cent in 2020, while 4G/LTE coverage was 99.5 per cent according to the latest data available for 2019.<sup>477</sup> In 2019 alone, mobile-broadband Internet traffic within North Macedonia amounted to 0.045 EB.<sup>478</sup>

In accordance with two important pieces of legislation,<sup>479</sup> the Agency for Electronic Communications (AEC) is the authority responsible for collecting and organizing geodetic information on broadband data development as provided by operators—physical infrastructure, equipment, etc. This information is accompanied by a short technical description of the electronic communications network and accompanying assets, with a minimum set of data according to the type of electronic communication network and assets involved.<sup>480</sup>

Based on these legal requirements, since 2017 AEC has been implementing a project to build a web collector for geographic information systems data that provides full electronic data delivery for newly built electronic communications and associated facilities, automatically verifies the correctness and completeness of the data submitted, and provides three user roles (for geodetic companies, operators, and AEC employees).<sup>481</sup> Moreover, the system supports the AEC's efforts regarding the mapping of service coverage and the availability and recognition of operators' future plans for identifying white and grey zones to ensure more efficient allocation of state aid.<sup>482</sup>

### 3.6.2 Government strategies, status of education quality, and the role of ICTs

In 2018, the Government of North Macedonia launched its Comprehensive Education Strategy for 2018-2025 and an associated action plan for 2020-2025.<sup>483</sup> The main priorities of the Strategy include: (i) developing student-centred instruction; (ii) measuring learning in terms of outcomes (rather than focusing solely on knowledge acquisition); and (iii) introducing national assessment. Other areas of action include national curriculum reforms to make learning more relevant to

<sup>474</sup> [www.stat.gov.mk/publikacii/2020/Macedonia%20in%20figures-2020-web.pdf](http://www.stat.gov.mk/publikacii/2020/Macedonia%20in%20figures-2020-web.pdf).

<sup>475</sup> <http://documents1.worldbank.org/curated/en/348431571341516627/pdf/Concept-Project-Information-Documents-PID-North-Macedonia-Digital-Economy-NODE-P170993.pdf>.

<sup>476</sup> ITU World Telecommunication/ICT Indicators Database online (2021), available at <http://handle.itu.int/11.1002/pub/81550f97-en> (indicator i911mw).

<sup>477</sup> ITU World Telecommunication/ICT Indicators Database online (2020), available at <http://handle.itu.int/11.1002/pub/81550f97-en> (indicators i271G and i271GA).

<sup>478</sup> ITU World Telecommunication/ICT Indicators Database online (2020), available at <http://handle.itu.int/11.1002/pub/81550f97-en> (indicator i136mwi).

<sup>479</sup> [www.slvesnik.com.mk/Issues/7b22c4194f6e4cdb80987251d70a75cd.pdf](http://www.slvesnik.com.mk/Issues/7b22c4194f6e4cdb80987251d70a75cd.pdf).

<sup>480</sup> [www.itu.int/en/ITU-D/Regional-Presence/Europe/Documents/Events/2020/RRF/20-11-26%20Background%20Paper\\_Broadband%20Mapping%20Systems%20in%20Europe%20and%20Regional%20Harmonization%20Initiatives\\_final.pdf](http://www.itu.int/en/ITU-D/Regional-Presence/Europe/Documents/Events/2020/RRF/20-11-26%20Background%20Paper_Broadband%20Mapping%20Systems%20in%20Europe%20and%20Regional%20Harmonization%20Initiatives_final.pdf).

<sup>481</sup> [https://aek.mk/wp-content/uploads/2018/03/irc2018\\_irc2018\\_s1\\_03.pdf](https://aek.mk/wp-content/uploads/2018/03/irc2018_irc2018_s1_03.pdf).

<sup>482</sup> [www.itu.int/en/ITU-D/Regional-Presence/Europe/Documents/Events/2020/RRF/Session%204\\_Zoran%20Aleksov\\_Broadband%20Mapping%20Systems%20in%20Non-EU%20Countries%20Aleksov%20Arsov%20Dervishov%20AEC%20%281%29.pdf](http://www.itu.int/en/ITU-D/Regional-Presence/Europe/Documents/Events/2020/RRF/Session%204_Zoran%20Aleksov_Broadband%20Mapping%20Systems%20in%20Non-EU%20Countries%20Aleksov%20Arsov%20Dervishov%20AEC%20%281%29.pdf).

<sup>483</sup> <http://mon.gov.mk/en/>.

the labour market. Activities in the area of evaluation and assessment and improving education quality include:<sup>484</sup>

- Significantly increasing the share of children in pre-school and introducing a compulsory year of pre-primary education (ages 5-6);
- Reforming the curricula and programmes for compulsory education to increase their relevance and attractiveness, better aligning them to children's stages of development and focusing more on learning outcomes;
- Supporting the development and consistent use of high-quality textbooks while reducing reliance on textbooks for teaching;
- Better orienting vocational education programmes towards the needs of the labour market;
- Strengthening the competence of teaching staff at all educational levels;
- Strengthening capacities at the central, local and school levels in management and ensuring harmonized and transparent policies; and
- Developing national assessments by 2020, a new concept for the state *matura* and final examination for secondary vocational school students, and the Macedonian Qualifications Framework.

Although the Strategy sets out the goals outlined above, the OECD has noted that specific targets for achieving such goals, as well as a defined process for monitoring progress, may be lacking.<sup>485</sup>

Modelled after the European Commission's Action Plan for Digital Education (2021-2027), which aims to foster greater European-level integration in digital education and create more resilient and future-proof education systems, North Macedonia's Concept Paper for the Development of a Distance Education System in Primary and Secondary Schools, adopted in 2020, is another central strategic document.<sup>486</sup>

According to OECD PISA<sup>487</sup> results for 2015-2018, North Macedonian students' scores for reading, mathematics and sciences were lower than the OECD average.<sup>488</sup> However, North Macedonia was the country in the region with the greatest improvement, ranking 11<sup>th</sup> from bottom in 2018, compared with 4<sup>th</sup> from bottom in the 2015 results.<sup>489</sup> Though improving, these results are modest and remain well below the mean scores for the EU and the OECD group of countries.

According to the 2015 and 2018 PISA tests, the percentage of low performers in each subject shrank by at least 9 percentage points between the two surveys, notably in mathematics

<sup>484</sup> [www.oecd-ilibrary.org/the-education-system-in-the-republic-of-north-macedonia\\_9b99696c-en.pdf?itemId=%2Fcontent%2Fcomponent%2F9b99696c-en&mimeType=pdf](http://www.oecd-ilibrary.org/the-education-system-in-the-republic-of-north-macedonia_9b99696c-en.pdf?itemId=%2Fcontent%2Fcomponent%2F9b99696c-en&mimeType=pdf).

<sup>485</sup> [www.oecd-ilibrary.org/docserver/9b99696c-en.pdf?expires=1606483875&id=id&accname=guest&checksum=44C0E7821372A7660D390D489038FFFC](http://www.oecd-ilibrary.org/docserver/9b99696c-en.pdf?expires=1606483875&id=id&accname=guest&checksum=44C0E7821372A7660D390D489038FFFC).

<sup>486</sup> [https://eacea.ec.europa.eu/national-policies/eurydice/content/ongoing-reforms-and-policy-developments\\_42\\_en](https://eacea.ec.europa.eu/national-policies/eurydice/content/ongoing-reforms-and-policy-developments_42_en).

<sup>487</sup> PISA tests the reading, mathematics and science performance of 15-year-old pupils across the world every three years. In the context of the European Union, PISA results are particularly important because they feed into the Education and Training 2020 strategic cooperation framework (ET2020). They form the basis for one of the ET2020 benchmarks: the rate of underachievers in reading, mathematics or science among 15-year-olds in the EU should be less than 15 per cent by 2020. Underachievers in PISA are those pupils who fail to reach the minimum proficiency level necessary to participate successfully in society. More information on the PISA indicators and ET2020 is available at [https://ec.europa.eu/education/sites/education/files/document-library-docs/pisa-2018-eu\\_1.pdf](https://ec.europa.eu/education/sites/education/files/document-library-docs/pisa-2018-eu_1.pdf).

<sup>488</sup> <https://files.eric.ed.gov/fulltext/EJ1130789.pdf>.

<sup>489</sup> [https://ec.europa.eu/neighbourhood-enlargement/sites/near/files/north\\_macedonia\\_report\\_2020.pdf](https://ec.europa.eu/neighbourhood-enlargement/sites/near/files/north_macedonia_report_2020.pdf).

and science. The improvements observed throughout the performance distribution vary by subject matter, although it must be noted that PISA is not longitudinal and therefore relies on two different samples of students for each iteration. The difference between girls' and boys' performance in mathematics is among the highest compared to other countries, with girls outperforming boys by a statistically significant margin of 7 points. This trend also holds for science, with girls outperforming boys by 19 points in 2018.<sup>490</sup> More specifically, 53.4 per cent of boys in North Macedonia do not achieve minimum proficiency in science, characterized by scoring less than PISA Level 2, and 0.7 per cent are considered high achievers, having scored Level 5 or above. On the other hand, only 44.9 per cent of girls do not meet minimum proficiency in science, with 1 per cent being considered high performers. There is, therefore, an 8.6 per cent difference between girls and boys achieving minimum proficiency in science. Similar comparisons are also evident in mathematics performance.<sup>491</sup> The percentage of 15-year-old girls expecting to work as ICT professionals at age 30 is also the largest among the countries and economies that participate in PISA, placing North Macedonia 1<sup>st</sup> out of 77 countries.<sup>492</sup>

In terms of education inequality, North Macedonia has among the largest rural-urban performance gaps of all PISA-participating countries and economies: 15-year-old students in rural areas perform 47 points behind their peers in urban settings in science (compared to the average difference across OECD countries of 17 points). This gap is equivalent to nearly 1.5 years of schooling.<sup>493</sup> Limited access to educational institutions at all levels in rural areas may be one of the factors behind students' underperformance. At 61 per cent, net enrolment at upper secondary level in rural areas is significantly lower than in urban areas (75 per cent).<sup>494</sup> Children in urban areas are also six times more likely to be enrolled in pre-primary education than their rural counterparts. Evidence indicates that learning conditions are poorer in rural settings (e.g. damaged floors and old electrical networks), reflecting the greater concentration of double-shift and satellite schools.<sup>495</sup>

For the primary and general secondary levels of education, it is the Bureau for Development of Education that prepares the curriculum.<sup>496</sup> For vocational subjects, the curriculum is planned by the Centre for Vocational Education and Training.<sup>497</sup> As a result, North Macedonia's schools have little autonomy over the curriculum.<sup>498</sup> Quality assurance in educational institutions is under the supervision of the State Educational Inspectorate.<sup>499</sup> Other reforms that relate to the curriculum changes proposed in the Comprehensive Education Strategy for 2018-2025 have been published and some are currently under way, with a Primary Education Act having been adopted in 2019.<sup>500</sup> Additionally, a recent trend has been observed over the years, showing that the country is moving towards introducing a more competency-based curriculum in the upper secondary grades.<sup>501</sup>

<sup>490</sup> [www.oecd.org/pisa/publications/PISA2018\\_CN\\_MKD.pdf](http://www.oecd.org/pisa/publications/PISA2018_CN_MKD.pdf).

<sup>491</sup> For more information please consult: <https://gpseducation.oecd.org> (PISA 2018 Table II.B1.7.6).

<sup>492</sup> <https://gpseducation.oecd.org/CountryProfile?primaryCountry=MKD&treshold=10&topic=PI>.

<sup>493</sup> <https://dx.doi.org/10.1787/9789264266490-en>.

<sup>494</sup> [http://wbgfiles.worldbank.org/documents/hdn/ed/saber/supporting\\_doc/CountryReports/ECD/](http://wbgfiles.worldbank.org/documents/hdn/ed/saber/supporting_doc/CountryReports/ECD/).

<sup>495</sup> J. Herczyński, "Policy Paper: Treatment of Satellite Schools" (MMS Project, Skopje, 2003).

<sup>496</sup> [www.bro.gov.mk/](http://www.bro.gov.mk/).

<sup>497</sup> [https://eacea.ec.europa.eu/national-policies/eurydice/content/former-yugoslav-republic-macedonia\\_en](https://eacea.ec.europa.eu/national-policies/eurydice/content/former-yugoslav-republic-macedonia_en).

<sup>498</sup> [www.oecd-ilibrary.org/docserver/9b99696c-en.pdf?expires=1606483875&id=id&accname=guest&checksum=44C0E7821372A7660D390D489038FFFC](http://www.oecd-ilibrary.org/docserver/9b99696c-en.pdf?expires=1606483875&id=id&accname=guest&checksum=44C0E7821372A7660D390D489038FFFC).

<sup>499</sup> [https://eacea.ec.europa.eu/national-policies/eurydice/content/former-yugoslav-republic-macedonia\\_en](https://eacea.ec.europa.eu/national-policies/eurydice/content/former-yugoslav-republic-macedonia_en).

<sup>500</sup> [https://eacea.ec.europa.eu/national-policies/eurydice/content/national-reforms-school-education-42\\_en](https://eacea.ec.europa.eu/national-policies/eurydice/content/national-reforms-school-education-42_en).

<sup>501</sup> [www.oecd-ilibrary.org/docserver/079fe34c-en.pdf?expires=1606485621&id=id&accname=guest&checksum=7A3B818E81B900CE141B71CCC65598CB](http://www.oecd-ilibrary.org/docserver/079fe34c-en.pdf?expires=1606485621&id=id&accname=guest&checksum=7A3B818E81B900CE141B71CCC65598CB).

In terms of infrastructure, indicators show that about one-third of schools in North Macedonia require major repairs, and satellite and multiple-shift schools are particularly prone to infrastructure problems, as well as lack of appropriate supplies and learning materials and insufficient support for teachers. In terms of disadvantaged groups, children and students from Roma communities continue to face barriers to regular, high-quality education and training. As assessed by the European Commission, separation along ethnic lines continues in education and training.<sup>502</sup>

In terms of school mapping and data collection, the Ministry of Education and Science developed and implemented an EMIS in 2010. However, an OECD-led study argues that the major factor impeding evidence-based policy-making in North Macedonia is underdeveloped and under-utilized data systems.<sup>503</sup> Central databases for school inspection and student examination results, for example, are not integrated with the EMIS, and data are collected multiple times from schools by different parts of the Ministry. Data are also not comparable across the sector, for example, as the State Statistical Office and the EMIS use different definitions for key indicators such as school dropout.<sup>504</sup>

Data on the key indicators for education is available on the webpage of North Macedonia's State Statistical Office. Relevant data from recent years on the number of regular primary, secondary and tertiary institutions, as well as on the number of students and teachers, are available. In addition to the MakStat interactive database catalogued by school year and indicators,<sup>505</sup> publications on primary and secondary education<sup>506</sup> also include data such as gender, the ethnic affiliation of both students and teachers, and information on the language of instruction. While public information on the exact geographic location of educational institutions is not available on the website of relevant bodies of the Government of North Macedonia, less specific information on the regional distribution of schools and number of students per school is published twice annually.<sup>507</sup> Additionally, in 2012, USAID published a map of all primary schools in Macedonia that were a part of the USAID Primary Education Project that ran from 2006 to 2012.<sup>508</sup>

With regards to the role of ICTs in schools, a 2019 OECD report on the country found that North Macedonia had high a computer-student ratio (0.63), similar to the average in OECD countries (0.77). In total, this amounts to more than 190 000 computers available in primary and secondary schools. However, it must be pointed out that most of these computers are now obsolete, according to the same study.<sup>509</sup> Moreover, access to broadband connectivity—particularly for marginalized and low-income populations—and low levels of ICT adoption remain enormous challenges for equitable access to education—in the context of the COVID-19 pandemic. While

<sup>502</sup> [https://ec.europa.eu/neighbourhood-enlargement/sites/near/files/north\\_macedonia\\_report\\_2020.pdf](https://ec.europa.eu/neighbourhood-enlargement/sites/near/files/north_macedonia_report_2020.pdf).

<sup>503</sup> [www.oecd-ilibrary.org/docserver/9b99696c-en.pdf?expires=1606760219&id=id&accname=guest&checksum=CD1B54F5745838006C39B0D09F7B9FAC](http://www.oecd-ilibrary.org/docserver/9b99696c-en.pdf?expires=1606760219&id=id&accname=guest&checksum=CD1B54F5745838006C39B0D09F7B9FAC).

<sup>504</sup> [www.oecd-ilibrary.org/docserver/9b99696c-en.pdf?expires=1606760219&id=id&accname=guest&checksum=CD1B54F5745838006C39B0D09F7B9FAC](http://www.oecd-ilibrary.org/docserver/9b99696c-en.pdf?expires=1606760219&id=id&accname=guest&checksum=CD1B54F5745838006C39B0D09F7B9FAC).

<sup>505</sup> [http://makstat.stat.gov.mk/PXWeb/pxweb/en/MakStat/MakStat\\_ObrazovanieNauka\\_OsnovnoObrazovanie](http://makstat.stat.gov.mk/PXWeb/pxweb/en/MakStat/MakStat_ObrazovanieNauka_OsnovnoObrazovanie).

<sup>506</sup> [www.stat.gov.mk/Publikacii/24.18.05.pdf](http://www.stat.gov.mk/Publikacii/24.18.05.pdf).

<sup>507</sup> <https://www.stat.gov.mk/PrikaziPoslednaPublikacija.aspx?id=42> (beginning of the 2017-2018 school year) and <https://www.stat.gov.mk/PrikaziPoslednaPublikacija.aspx?id=41> (end of the 2017-2018 school year).

<sup>508</sup> [www.google.com/maps/d/u/0/viewer?msa=0&ll=41.75649777741486%2C21.728210000000008&spn=1.706845%2C2.469177&mid=13TSCACnczeZcpdpeaXuJVasjSol&z=8](https://www.google.com/maps/d/u/0/viewer?msa=0&ll=41.75649777741486%2C21.728210000000008&spn=1.706845%2C2.469177&mid=13TSCACnczeZcpdpeaXuJVasjSol&z=8).

<sup>509</sup> [www.oecd-ilibrary.org/docserver/9b99696c-en.pdf?expires=1608196577&id=id&accname=guest&checksum=A4139AFCE4F735CBAC3E343DB228F4E](http://www.oecd-ilibrary.org/docserver/9b99696c-en.pdf?expires=1608196577&id=id&accname=guest&checksum=A4139AFCE4F735CBAC3E343DB228F4E).

relevant government bodies have started to provide Internet access to poorer households,<sup>510</sup> the gap remains significant, especially in the context of disadvantaged schools and communities located in rural areas.<sup>511</sup> Despite the efforts made by the Government to ensure continuity of learning, the management and organization of the learning process was left largely to the discretion of individual schools and teachers.<sup>512</sup>

In theory, digital competencies for teachers are among general teacher competence criteria in North Macedonia.<sup>513</sup> However, a study has revealed that computers have only been used minimally by teachers in the country. With support from the Open Society Foundations, a Metamorphosis Foundation study on the conditions and challenges of distance education in primary schools has shown that almost one-third of teaching staff (31.6 per cent) state that their Internet access at school is limited to their mobile phone.<sup>514</sup> The study also reiterated the fact that there are locations where schools do not offer any Internet access. Among its numerous recommendations on improving IT infrastructure are those regarding the availability of educational materials for all students, especially for those students who attend classes in the languages of smaller communities, and promoting the use of open educational resources as an alternative to classic textbooks and teaching aids.<sup>515</sup>

Regarding ICT gaps in the context of the COVID-19 pandemic, a July 2020 UNICEF survey of selected North Macedonian school directors, teachers and parents showed that access to the Internet and ICTs was a barrier for some households—37 per cent of parents reported that children needed to share laptops and computers with other family members and others reported not having a stable Internet connection; only 5 per cent reported not having access to a laptop or computer. Student-teacher communication has also been highlighted as a factor affected by unequal access to ICTs. Almost 77 per cent of teachers could not maintain regular communication with students during distance learning. Close to 80 per cent of parents had difficulty supporting their children with distance learning, and nearly 65 per cent had technical difficulties accessing the necessary equipment (including lack of connectivity, computer, printer, etc.).<sup>516</sup> Phase 2 of the same survey, from December 2020, showed a general amelioration of the ICT situation for distance education. By then, 26 per cent of parents reported that children needed to share devices, 23 per cent reported connectivity problems, 63 per cent of teachers struggled to maintain regular communication with students, and 54 per cent of parents could not allocate enough time to directly support their children with distance learning. Nevertheless, 7 per cent of parents reported that their children did not have access to a laptop or PC for online education.<sup>517</sup> Furthermore, a survey conducted by the Ministry of Labour and Social Policy showed that at least 30 000 pupils from disadvantaged backgrounds did not have the conditions necessary to follow online classes.<sup>518</sup>

<sup>510</sup> <http://documents1.worldbank.org/curated/en/590751590682058272/pdf/The-Economic-and-Social-Impact-of-COVID-19-Education.pdf>.

<sup>511</sup> <https://balkaninsight.com/2020/10/01/schools-out-how-pandemic-derailed-north-macedonias-education/>.

<sup>512</sup> <http://documents1.worldbank.org/curated/en/353401603383886183/pdf/Project-Information-Document-Primary-Education-Improvement-Project-P171973.pdf>.

<sup>513</sup> <https://op.europa.eu/en/publication-detail/-/publication/d7834ad0-ddac-11e9-9c4e-01aa75ed71a1/language-en/format-PDF/source-105790537>.

<sup>514</sup> [https://metamorphosis.org.mk/wp-content/uploads/2020/09/oor\\_istrazuvanje\\_2020.pdf](https://metamorphosis.org.mk/wp-content/uploads/2020/09/oor_istrazuvanje_2020.pdf).

<sup>515</sup> [https://metamorphosis.org.mk/en/aktivnosti\\_arhiva/metamorphosis-organizer-of-the-session-challenges-to-open-and-online-education-in-north-macedonia-as-part-of-the-conference-pubmet2020/](https://metamorphosis.org.mk/en/aktivnosti_arhiva/metamorphosis-organizer-of-the-session-challenges-to-open-and-online-education-in-north-macedonia-as-part-of-the-conference-pubmet2020/).

<sup>516</sup> [www.unicef.org/northmacedonia/press-releases/majority-school-principals-teachers-and-parents-support-schools-reopening-september](http://www.unicef.org/northmacedonia/press-releases/majority-school-principals-teachers-and-parents-support-schools-reopening-september).

<sup>517</sup> Updated information provided by North Macedonia's Ministry of Education and Science.

<sup>518</sup> <https://china-cee.eu/2020/07/29/north-macedonia-social-briefing-covid-19-disruptions-and-improvised-solutions-in-a-fractured-educational-system/>.

### 3.6.3 Multistakeholder partnerships and financing mechanisms fostering investment in school connectivity

In 2002, the Chinese Government announced the donation of more than 5 300 personal computers<sup>519</sup> to primary and secondary schools between 2003 and 2005,<sup>520</sup> supporting what was to become the E-Schools Project of the Ministry of Education and Science, which ran from 2003 to 2008. Within the framework of this project, nearly 460 computer labs were built, covering all primary and secondary schools,<sup>521</sup> and a series of training programmes was conducted for most secondary and primary school teachers, focusing on the use of ICTs through project-based learning strategies and networking.<sup>522</sup>

In 2003, the Ministry of Information Society and Administration established a partnership with USAID to co-fund the deployment of the Macedonia Connects project.<sup>523</sup> Building upon other education-related initiatives such as the Primary Education Project, this three-year project aimed to bring connectivity to rural areas using the then-existing Wi-Fi-based Internet access point infrastructure rolled out in remote areas, as well as an academic broadband network,<sup>524</sup> which relied largely on a Motorola-enabled wireless technology solution set—a pre-WiMAX solution.<sup>525</sup> The canopy solution enabled the majority of the country's rural schools to be connected to the Internet with speeds of up to 1 Mbit/s, and a local company called On.net was contracted to provide wireless access for all of Macedonia's schools. Both Macedonia Connects and the Primary Education Project were USAID-supported initiatives executed through the Academy for Educational Development).<sup>526</sup>

In providing connectivity, the Ministry of Education and Science did not favour any particular technology. However, broadband service provision in schools relies on asymmetric DSL, which, in turn, is either dependent on the existing copper infrastructure constructed decades ago by Macedonia's former Postal, Telephone and Telegraph Service and later transferred into the ownership of Makedonski Telekom, or on the use of infrastructure provided by USAID's Macedonia Connects project.<sup>527</sup>

A 2014 World Bank assessment identified that the governmental intervention had had a positive effect on local rural development and had gone beyond the results initially foreseen. In terms of schools with poor connectivity or no connectivity at all, the project enabled free broadband to be provided for educational and administrative purposes. Wi-Fi kiosks<sup>528</sup> supplied Internet access to 115 schools that faced fixed-line connectivity issues in the 2013-2014 school year.<sup>529</sup>

With the end of the project in 2007, USAID announced that not only were all the nation's schools connected to the Internet, but that the project design also provided coverage for access by private sector businesses, the Government, individuals, etc.<sup>530</sup> Over time, private operators have filled the gap and have found a business case to start providing Internet access, and other

<sup>519</sup> <https://ioinformatics.org/journal/INFOL001.pdf>.

<sup>520</sup> <https://ioinformatics.org/journal/INFOL001.pdf>.

<sup>521</sup> <https://ioinformatics.org/journal/INFOL001.pdf>.

<sup>522</sup> <http://ciit.finki.ukim.mk/data/papers/6CiiT/6CiiT-17.pdf>.

<sup>523</sup> <https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.215.2033&rep=rep1&type=pdf>.

<sup>524</sup> [www.itu.int/ITU-D/treg/broadband/BB\\_MDG\\_Macedonia\\_BBCOM.pdf](http://www.itu.int/ITU-D/treg/broadband/BB_MDG_Macedonia_BBCOM.pdf).

<sup>525</sup> [https://solutionscenter.nethope.org/assets/collaterals/GBI\\_Macedonia\\_Connects-18Mar2010.pdf](https://solutionscenter.nethope.org/assets/collaterals/GBI_Macedonia_Connects-18Mar2010.pdf).

<sup>526</sup> [https://solutionscenter.nethope.org/assets/collaterals/GBI\\_Macedonia\\_Connects-18Mar2010.pdf](https://solutionscenter.nethope.org/assets/collaterals/GBI_Macedonia_Connects-18Mar2010.pdf).

<sup>527</sup> <https://ininet.org/report-no-ac311069-macedonia-former-yugoslav-republic-of.html?page=10>.

<sup>528</sup> <https://ininet.org/report-no-ac311069-macedonia-former-yugoslav-republic-of.html?page=10>.

<sup>529</sup> [www.worldbank.org/en/news/feature/2014/07/23/fresh-air-free-internet-in-rural-macedonia](http://www.worldbank.org/en/news/feature/2014/07/23/fresh-air-free-internet-in-rural-macedonia).

<sup>530</sup> [https://solutionscenter.nethope.org/assets/collaterals/GBI\\_Macedonia\\_Connects-18Mar2010.pdf](https://solutionscenter.nethope.org/assets/collaterals/GBI_Macedonia_Connects-18Mar2010.pdf).



operators started to drastically reduce the cost of Internet access.<sup>531</sup> In 2014, however, in 522 out of 680 locations, high deployment and maintenance costs still posed constraints to commercial Internet access development.<sup>532</sup>

In 2007, the Government announced an international tender for purchasing 100 000 computers within the framework of the “A Computer for Every Child” project. For that purpose, more than EUR 20 million were projected for the 2007 and 2008 budgets—one of the largest projects relating to ICTs in education in the country, though nearly EUR 60 million were spent.<sup>533</sup> The Macedonian Government has opted to use client-server technology, rather than offer one laptop per child.<sup>534</sup> As mentioned previously, this resulted in North Macedonia having a relatively high computer-student ratio (0.43), though updating equipment which is now obsolete is proving a major financial challenge.<sup>535</sup>

In 2019, the Government adopted the National Operational Broadband Plan, which is an important strategy that builds on previous ICT-related policy frameworks, comprising the National Strategy for the Development of Electronic Communications with Information Technologies and the National Strategy for Information Society Development and Action Plan. This new plan relies on information from the national broadband mapping activities described above, as well as on expected investments by telecommunication operators in the near future. Aligned with the objectives of the Digital Agenda for Europe and the European Gigabit Society, one of the goals of the strategy is to ensure that all public institutions (schools, universities, research centres and other educational institutions, healthcare facilities, ministries, courts, local governments and other state authorities and bodies) have symmetrical Internet access with a speed of at least 1 Gbit/s by 2029.<sup>536</sup>

### 3.6.4 National responses to COVID-19 and educational initiatives for distance learning

On 10 March 2020, the Government of North Macedonia closed all schools and kindergartens in the country as a result of the spread of COVID-19. Despite a swift education sector response to the COVID-19 pandemic in North Macedonia, learning losses are anticipated,<sup>537</sup> particularly for the most vulnerable children. Children with disabilities, as well as migrant, refugee and undocumented children in North Macedonia, are disproportionately affected by lack of access not only to the ICT equipment, such as television, mobile phones and other mobile devices, needed to engage in digital learning but also to inclusive printed materials that support their learning in languages they speak and understand.

The Government managed to mount a quick response and started to offer many options of live broadcast and online lessons tailored to primary and secondary institutions across the country in a variety of topics and subjects. As part of UNICEF’s support under the #Inno4Edu initiative,

<sup>531</sup> [www.govtech.com/dc/articles/Macedonia-Transformed-Through-Broadband.html](http://www.govtech.com/dc/articles/Macedonia-Transformed-Through-Broadband.html).

<sup>532</sup> [www.worldbank.org/en/news/feature/2014/07/23/fresh-air-free-Internet-in-rural-macedonia](http://www.worldbank.org/en/news/feature/2014/07/23/fresh-air-free-Internet-in-rural-macedonia).

<sup>533</sup> [www.oecd-ilibrary.org/docserver/9b99696c-en.pdf?expires=1606760219&id=id&accname=guest&checksum=CD1B54F5745838006C39B0D09F7B9FAC](http://www.oecd-ilibrary.org/docserver/9b99696c-en.pdf?expires=1606760219&id=id&accname=guest&checksum=CD1B54F5745838006C39B0D09F7B9FAC).

<sup>534</sup> <http://ciit.finki.ukim.mk/data/papers/6CiiT/6CiiT-17.pdf>.

<sup>535</sup> [www.oecd-ilibrary.org/docserver/9b99696c-en.pdf?expires=1606760219&id=id&accname=guest&checksum=CD1B54F5745838006C39B0D09F7B9FAC](http://www.oecd-ilibrary.org/docserver/9b99696c-en.pdf?expires=1606760219&id=id&accname=guest&checksum=CD1B54F5745838006C39B0D09F7B9FAC).

<sup>536</sup> [https://mioa.gov.mk/sites/default/files/pbl\\_files/documents/reports/north\\_macedonia\\_national\\_operational\\_broadband\\_plan\\_final\\_en.pdf](https://mioa.gov.mk/sites/default/files/pbl_files/documents/reports/north_macedonia_national_operational_broadband_plan_final_en.pdf).

<sup>537</sup> <http://documents1.worldbank.org/curated/en/353401603383886183/pdf/Project-Information-Documents-Primary-Education-Improvement-Project-P171973.pdf>.

which aims to set up an environment for high-quality teaching and learning through co-creation and innovation, two projects, in particular, stood out from the early phases of COVID-response collaboration in North Macedonia: the TV-Classroom and the e-Classroom.<sup>538</sup>

The TV-Classroom provides educational programmes for younger children in the country. It is a collaboration between the Ministry of Education and Science, the Bureau for the Development of Education, UNICEF, children's television producer OXO, and the national broadcaster Macedonian Radio and Television. The initial classes were offered in all five languages of instruction in North Macedonia: Macedonian, Albanian, Turkish, Serbian and Bosnian. In addition to volunteer teachers, the educators engaged with TV-Classroom are already part of a programme funded by UNICEF and the United Kingdom Government to introduce social and emotional learning in pre-schools, which aims to help children cope with stress and trauma, manage their emotions and develop skills such as empathy, resilience, kindness and self-confidence.<sup>539</sup>

The e-Classroom, on the other hand, builds on the UNICEF-supported Eduino online learning platform, a portal where students can access recorded classes, live lessons and play-based learning activities.<sup>540</sup> This online learning platform was already in place in North Macedonia to support early learning and was due to be launched in 2020.<sup>541</sup> Within three days of the school closures, the Ministry of Education and Science and UNICEF issued a joint call for teachers to volunteer to film lessons for the platform, which was answered by 1 000 teachers. The classes are organized by topic and grade and are available via Eduino's YouTube channel.<sup>542</sup>

The e-Classroom can be accessed by up to 100 000 users at the same time and is being improved continuously in response to feedback from students, parents and educators; it is registered with the domain name of the Bureau for Development of Education, the government body responsible for the country's curriculum and the professional development of teachers. In addition to serving as a digital learning platform, Eduino enables collaboration and professional development for primary and secondary school teachers. By the end of 2020, the platform hosted a professional development community of 22 700 educators, who both benefit from and participate in the creation of resources, webinars and trainings.<sup>543</sup> Given the high levels of access and use of the platform among parents, students and educators, plans are under way to expand the content still further to cover children of pre-primary and upper-secondary age and to keep it in place beyond the context of the pandemic.<sup>544</sup> The Eduino platform also demonstrates the efficiency of co-creating local solutions: 30 000 certificates have been offered to teachers in recognition of their contribution to the development of games, educational materials, video lessons and tutorials. Support was offered to both teachers and parents on adapting resources for children with disabilities, and a new feature has been added that enables crowd-sourcing for the development of subtitles on lessons to make them accessible for learners with disabilities.<sup>545</sup> The e-Classroom is also part of a UNICEF initiative funded by the United Kingdom Government through the British Embassy in Skopje, in cooperation with North Macedonia's Ministry of Labour and Social Policy, Ministry of Education and Science and Bureau for Development of Education

<sup>538</sup> [www.unicef.org/northmacedonia/10-more-play-based-learning-activities-children](http://www.unicef.org/northmacedonia/10-more-play-based-learning-activities-children).

<sup>539</sup> For more information, please contact UNICEF ECA Regional Office.

<sup>540</sup> [www.eduino.gov.mk/](http://www.eduino.gov.mk/).

<sup>541</sup> For more information, please contact UNICEF ECA Regional Office.

<sup>542</sup> [www.youtube.com/channel/UCOJWh4fQdKVdnveS8dBEOaw](https://www.youtube.com/channel/UCOJWh4fQdKVdnveS8dBEOaw).

<sup>543</sup> See: <https://www.unicef.org/media/79701/file/ECARO-COVID19-SitRep-21-April-2020.pdf>.

<sup>544</sup> For more information, please contact UNICEF ECA Regional Office.

<sup>545</sup> UNICEF Europe and Central Asia Region COVID-19 response in education questionnaire.

and implemented by SmartUp – Social Innovation Lab.<sup>546</sup> The institutional experience gained through the development of Eduino, alongside the resources and competencies developed, has supported government buy-in for digital learning and established a government-owned and managed distance learning system that continues to expand in reach and improve in quality to serve the entire education sector.<sup>547</sup>

Other initiatives include UNICEF's support for teachers through collaboration with the Bureau for Development of Education to provide online training and webinars, reaching more than 16 000 teachers by the end of 2020, and psychosocial support for teachers and learners. UNICEF has also supported the compilation of play-based learning tools for children aged 3 to 10,<sup>548</sup> which feature storybooks on socio-emotional development. The materials are a combination of UNICEF resources and activities that educators across the country have prepared for Eduino.<sup>549</sup> Moreover, UNICEF has also compiled a list of free and open digital tools to support distance learning that may be useful for educators in North Macedonia.<sup>550</sup>

In August 2020, the Roma Education Fund provided hundreds of tablets with free Internet access to Roma students enrolled in primary, secondary and tertiary education in North Macedonia to support students with distance learning.<sup>551</sup> The funds were guaranteed by the Roma Education Fund to two implementing partners in North Macedonia. The Roma Democratic Development Association (SONCE) was contracted in the amount of EUR 20 306 with the aim of improving the quality of schooling among the most vulnerable Roma children and investing in the smart devices necessary for distance learning. Under a project entitled "Improving the learning environment for primary school students", SONCE distributed a total of 222 tablets with free Internet access in municipalities across the country.<sup>552</sup>

The other implementing partner of the Roma Education Fund was the public association Romaversitas Skopje, which received EUR 17 810 to reduce the probability of dropout among Roma students in secondary and tertiary education by providing students with mentoring and IT equipment. As part of a project entitled "Romaversitas in emergencies – we care about your education", Romaversitas Skopje (in cooperation with the AVAJA initiative) gave 210 tablets to Roma secondary school students, along with 10 GB of free Internet access.<sup>553</sup> The eligible beneficiaries were Roma students from families at risk, i.e. those receiving minimum social assistance, low-income families, or households lacking adequate facilities or smart devices.<sup>554</sup>

As COVID-19 progressed in the country, the Government announced that the 2020-2021 academic year would start mostly online, except for primary school students from first to third grade and a few small classes. Government protocols also anticipated a maximum capacity of 20 students per class for effective social distancing.<sup>555</sup> In October 2020, North Macedonia

<sup>546</sup> [www.unicef.org/northmacedonia/press-releases/new-digital-learning-platform-launched-support-distance-learning-children](http://www.unicef.org/northmacedonia/press-releases/new-digital-learning-platform-launched-support-distance-learning-children).

<sup>547</sup> [www.unicef.org/media/79701/file/ECARO-COVID19-SitRep-21-April-2020.pdf](http://www.unicef.org/media/79701/file/ECARO-COVID19-SitRep-21-April-2020.pdf).

<sup>548</sup> [www.unicef.org/northmacedonia/play-based-learning-activities-children-aged-3-10](http://www.unicef.org/northmacedonia/play-based-learning-activities-children-aged-3-10).

<sup>549</sup> [www.unicef.org/northmacedonia/play-based-learning-activities-children-aged-3-10](http://www.unicef.org/northmacedonia/play-based-learning-activities-children-aged-3-10).

<sup>550</sup> [www.unicef.org/northmacedonia/free-and-open-digital-tools-support-remote-learning-during-temporary-school-closures](http://www.unicef.org/northmacedonia/free-and-open-digital-tools-support-remote-learning-during-temporary-school-closures).

<sup>551</sup> [www.facebook.com/RomaEducationFund/posts/allinthistogether-in-north-macedoniaref-emergencyfund-covid19roma-education-fund/1965943496874308/](https://www.facebook.com/RomaEducationFund/posts/allinthistogether-in-north-macedoniaref-emergencyfund-covid19roma-education-fund/1965943496874308/).

<sup>552</sup> <http://sonce.org.mk/roma-education-fund-provides-457-tablets-and-free-Internet-for-roma-students/>.

<sup>553</sup> <http://sonce.org.mk/roma-education-fund-provides-457-tablets-and-free-Internet-for-roma-students/>.

<sup>554</sup> [www.romaeducationfund.org/roma-education-funds-emergency-response-fund-for-north-macedonia-provided-457-tablets-with-free-Internet-access-to-roma-students-to-manage-remote-learning-amidst-covid-19-crisis/](http://www.romaeducationfund.org/roma-education-funds-emergency-response-fund-for-north-macedonia-provided-457-tablets-with-free-Internet-access-to-roma-students-to-manage-remote-learning-amidst-covid-19-crisis/).

<sup>555</sup> [www.xinhuanet.com/english/2020-08/19/c\\_139300511.htm](http://www.xinhuanet.com/english/2020-08/19/c_139300511.htm).

gave greater powers to the inspection services to sanction those who violate COVID-related health protocols and introduced emergency teaching methods for primary and secondary schools, enabling student assessments to be carried out without students being physically present.<sup>556</sup> Moreover, the Ministry of Education and Science has established daily monitoring of teaching modalities and challenges in access to and quality of distance learning, as well as infection-tracking among children and staff. This has supported calls to keep schools open by demonstrating a low rate of COVID-19 transmission in schools in 2020.<sup>557</sup> Nonetheless, schools have remained at least partially closed for the entirety of the 2020-2021 school year, until June 2021.

## 3.7 Serbia

### 3.7.1 Overview of the education system and status of broadband

Serbia's constitution and relevant laws guarantee that all children have access to and are included in education.<sup>558</sup> The country's educational system offers a free, mandatory programme of primary education and one year of preparatory pre-school education. Secondary education is free but not mandatory. Children enter compulsory education at the age of 5.5 years old, when they start the pre-school preparatory pathway, which is followed by eight years of primary education—from ages 7 to 14.<sup>559</sup> Since 2009, the Serbian Government has engaged with significant changes and policy reforms in the education system, focusing on improving the quality, equity and efficiency dimensions of education.<sup>560</sup> However, despite some progress, the quality, equity and relevance of education and training do not fully meet labour market needs, and the question of inequality in education remains a challenge in the country.<sup>561</sup> Owing to these reforms and new national strategies on standards, teacher training and school evaluations, the education system is continuing to update curricula for all 12 years of general education.<sup>562</sup> In the face of existing gaps concerning disadvantaged students, pieces of secondary legislation were recently adopted to provide for more effective support for students in need, including better inclusion of minority groups such as the Roma population.

As reported by the European Commission in 2019, half of children aged three to five attend formal early child care, while only 9 per cent of children from Roma settlements aged three to five are enrolled.<sup>563</sup> As for early childhood education, MICS 6 data show that attendance rates are 61 per cent of all children between the ages of three and five years and 7.4 per cent of children living in Roma settlements.<sup>564</sup> The organization of secondary education in the country falls under the responsibility of the Ministry of Education, Science and Technological Development, in cooperation with the local authorities. Some 792 592 students attend primary and secondary

<sup>556</sup> [www.oecd.org/south-east-europe/COVID-19-Crisis-in-North-Macedonia.pdf](http://www.oecd.org/south-east-europe/COVID-19-Crisis-in-North-Macedonia.pdf).

<sup>557</sup> [www.unicef.org/media/85766/file/UNICEF-ECARO-COVID-19-Situation-Report-No-14-for-25-September-21-October-2020.pdf](http://www.unicef.org/media/85766/file/UNICEF-ECARO-COVID-19-Situation-Report-No-14-for-25-September-21-October-2020.pdf).

<sup>558</sup> [www.oecd-ilibrary.org/docserver/225350d9-en.pdf?expires=1606071342&id=id&accname=guest&checksum=8B002C529EBAA6880ED051C63D4E3BA3](http://www.oecd-ilibrary.org/docserver/225350d9-en.pdf?expires=1606071342&id=id&accname=guest&checksum=8B002C529EBAA6880ED051C63D4E3BA3).

<sup>559</sup> <http://uis.unesco.org/en/country/rs>.

<sup>560</sup> [www.unece.org/fileadmin/DAM/RCM\\_Website/SDG\\_4-1\\_Serbia.pdf](http://www.unece.org/fileadmin/DAM/RCM_Website/SDG_4-1_Serbia.pdf).

<sup>561</sup> [www.oecd-ilibrary.org/docserver/225350d9-en.pdf?expires=1606071342&id=id&accname=guest&checksum=8B002C529EBAA6880ED051C63D4E3BA3](http://www.oecd-ilibrary.org/docserver/225350d9-en.pdf?expires=1606071342&id=id&accname=guest&checksum=8B002C529EBAA6880ED051C63D4E3BA3).

<sup>562</sup> <https://ec.europa.eu/neighbourhood-enlargement/sites/near/files/20190529-serbia-report.pdf>.

<sup>563</sup> <https://ec.europa.eu/neighbourhood-enlargement/sites/near/files/20190529-serbia-report.pdf>.

<sup>564</sup> [https://mics-surveys-prod.s3.amazonaws.com/MICS6/Europe%20and%20Central%20Asia/Serbia/2019/Survey%20findings/Serbia%20%28National%20and%20Roma%20Settlements%29%202019%20MICS%20SFR\\_English.pdf](https://mics-surveys-prod.s3.amazonaws.com/MICS6/Europe%20and%20Central%20Asia/Serbia/2019/Survey%20findings/Serbia%20%28National%20and%20Roma%20Settlements%29%202019%20MICS%20SFR_English.pdf).

school in the country.<sup>565</sup> According to the Statistical Office of the Republic of Serbia, there were 3 317 active primary school units (i.e. the total number of institutions, including branches and satellite campuses) and 1 750 schools (i.e. legal entities under sole management) in Serbia in the 2018-2019 academic year. In total, 524 518 students attended these schools.<sup>566</sup> In terms of secondary education, official data show that about 249,455 students were enrolled in 515 regular high schools during the same period.<sup>567</sup>

Enrolment rates remained high in both primary and lower secondary education, at close to 100 per cent, and around 90 per cent at upper secondary level, while the completion rate for children of primary school age is 98.7 per cent.<sup>568</sup> Moreover, the adjusted net attendance rate for young people of upper secondary school age is 98.2 per cent.<sup>569</sup> In 2019, out-of-school rates at primary level (0.6 per cent) and lower secondary level (0.2 per cent) were among the lowest in the region. The same is true at upper secondary level, where the rate is 3.8 per cent.<sup>570</sup> It is important to note the disparities with out-of-school rates for Roma households, however, which stand at 6.3 per cent, 8.5 per cent and 57.1 per cent, respectively.<sup>571</sup> Although this is below the regional average, it still indicates similar patterns to elsewhere, which show notable increases in out-of-school rates between lower and upper secondary education levels. Overall, Serbia has more than 45 000 children and adolescents who are out of school.<sup>572</sup> In 2017, the rate of early school leavers fell to 6.2 per cent, from 7.4 per cent in 2015, while lifelong learning remains low at 4.4 per cent, far below the EU 2020 target of 15 per cent.<sup>573</sup>

In terms of learning quality, UNICEF calculations show that, among the nine countries included in this study, Serbia has some of the lowest percentages of children and adolescents who do not achieve minimum proficiency in foundational skills. According to UNICEF estimates, approximately 1 in 3 students (37.2 per cent)<sup>574</sup> do not achieve minimum proficiency, leading to cumulative learning and skills gaps across the course of their lives. UNESCO data nevertheless show that the literacy rate for the 15-24 years age group in Serbia is 99.7 per cent,<sup>575</sup> yet it is important to note that definitions for literacy and standards for proficiency vary drastically.

In 2018, Serbia's expenditure on education stood at 3.59 per cent of GDP.<sup>576</sup> Serbia also received significant assistance from the EU to improve its education system. Since 2003, the EU has invested over EUR 100 million in reforming and modernizing education in Serbia.<sup>577</sup>

<sup>565</sup> <http://data.uis.unesco.org/#> (indicators: enrolment in primary education, both sexes; enrolment in secondary education, both sexes).

<sup>566</sup> [www.stat.gov.rs/en-us/vesti/20200629-osnovno-obrazovanje-kraj-skolske-godine-2019/?s=1102](http://www.stat.gov.rs/en-us/vesti/20200629-osnovno-obrazovanje-kraj-skolske-godine-2019/?s=1102).

<sup>567</sup> [www.stat.gov.rs/sr-latn/vesti/20200629-srednje-obrazovanje-kraj-skolske-201819-godine/?s=1103](http://www.stat.gov.rs/sr-latn/vesti/20200629-srednje-obrazovanje-kraj-skolske-201819-godine/?s=1103).

<sup>568</sup> <https://data.worldbank.org/indicator/SE.PRM.CMPT.ZS?locations=RS>.

<sup>569</sup> <https://data.worldbank.org/indicator/SE.PRM.TENR?locations=RS>.

<sup>570</sup> According to the latest available figures from UIS.

<sup>571</sup> [https://mics-surveys-prod.s3.amazonaws.com/MICS6/Europe%20and%20Central%20Asia/Serbia/2019/Survey%20findings/Serbia%20%28National%20and%20Roma%20Settlements%29%202019%20MICS%20SFR\\_English.pdf](https://mics-surveys-prod.s3.amazonaws.com/MICS6/Europe%20and%20Central%20Asia/Serbia/2019/Survey%20findings/Serbia%20%28National%20and%20Roma%20Settlements%29%202019%20MICS%20SFR_English.pdf).

<sup>572</sup> <http://data.uis.unesco.org/#> (indicator: out-of-school children, adolescents and youth of primary and secondary school age, both sexes).

<sup>573</sup> <https://ec.europa.eu/neighbourhood-enlargement/sites/near/files/20190529-serbia-report.pdf>.

<sup>574</sup> UNICEF calculation of the number of students in primary, lower secondary and upper secondary not achieving minimum proficiency in mathematics; data for Serbia are based on the latest available figures from UIS and OECD PISA data.

<sup>575</sup> <http://uis.unesco.org/en/country/rs>.

<sup>576</sup> <http://data.uis.unesco.org>.

<sup>577</sup> <https://ec.europa.eu/neighbourhood-enlargement/sites/near/files/20190529-serbia-report.pdf>; <https://www.euzatebe.rs/en/sectors/education>.

Regarding broadband development in the country, ITU data show that 78.4 per cent of individuals in Serbia used the Internet in 2020.<sup>578</sup> In 2010, the ITU figure for the country was 40.9 per cent.<sup>579</sup> In 2020, the number of fixed-broadband subscriptions per 100 inhabitants was 25.1,<sup>580</sup> the majority being through xDSL (37.8 per cent) or cable access (44.8 per cent)<sup>581</sup> – although the number of users of xDSL users has been slowly decreasing over the years.<sup>582</sup>

Serbia's xDSL subscriptions structure has changed significantly over time, with a significant increase in the number of users of VDSL technology to 42 per cent of the total number of xDSL users, owing to greater demand for packages with greater throughput.<sup>583</sup> Wireless broadband access, however, remained stable in the 2013-2018 period,<sup>584</sup> although average data rates were improved by all operators in 2019.<sup>585</sup> While the northern districts of Belgrade and South Bačka have the highest household penetration rates in terms of broadband subscriptions, the southern districts Jablanica and Pčinja have the lowest.<sup>586</sup> ITU data show that 72.9 per cent of households in Serbia have Internet access at home.<sup>587</sup> According to the Statistical Office of the Republic of Serbia's Annual Survey on the Use of ICTs for 2020, 74.3 per cent of households owned a computer, 94.1 per cent owned a mobile phone, and 80.8 per cent had a broadband connection. In addition, 77.5 per cent of households without a broadband connection reported not needing the Internet.<sup>588</sup> Moreover, Serbia is the country with the highest penetration rates for mobile services in the Balkans.<sup>589</sup> In 2019, the number of active mobile-broadband subscription per 100 inhabitants was 94.3.<sup>590</sup> With a relatively equally distributed market share, the total revenue of all mobile network operators has been constant over the last three years, but individual net realized profits are declining at the same time.<sup>591</sup>

For the first quarter of 2021, the Regulatory Agency for Electronic Communications and Postal Services (RATEL) reports that the majority of fixed-broadband Internet subscribers (55.1 per cent) connected to the Internet benefited from connectivity speed of over 50 Mbit/s, while around 36.2 per cent accessed the Internet at between 10 Mbit/s and less than 30 Mbit/s.<sup>592</sup> Data transmission over mobile networks has shown growth in the period analysed, amounting to 140.2 million GB in the first quarter of 2021, which means that a mobile-broadband subscriber

<sup>578</sup> ITU World Telecommunication/ICT Indicators Database online (2021), available at <http://handle.itu.int/11.1002/pub/81550f97-en> (indicator i99H).

<sup>579</sup> For more information please consult: [www.itu.int/en/ITU-D/Statistics/](http://www.itu.int/en/ITU-D/Statistics/).

<sup>580</sup> ITU World Telecommunication/ICT Indicators Database online (2021), available at <http://handle.itu.int/11.1002/pub/81550f97-en> (indicator i992b).

<sup>581</sup> [www.ratel.rs/uploads/documents/empire\\_plugin/Q1%202020%20ENG%20pdf.pdf](http://www.ratel.rs/uploads/documents/empire_plugin/Q1%202020%20ENG%20pdf.pdf).

<sup>582</sup> [www.ratel.rs/uploads/documents/empire\\_plugin/An%20Overview%20Of%20The%20Telecom%20And%20Postal%20Services%20Market%20In%20The%20Republic%20Of%20Serbia%20In%202018.pdf](http://www.ratel.rs/uploads/documents/empire_plugin/An%20Overview%20Of%20The%20Telecom%20And%20Postal%20Services%20Market%20In%20The%20Republic%20Of%20Serbia%20In%202018.pdf).

<sup>583</sup> [www.ratel.rs/uploads/documents/empire\\_plugin/An%20Overview%20Of%20The%20Telecom%20And%20Postal%20Services%20Market%20In%20The%20Republic%20Of%20Serbia%20In%202018.pdf](http://www.ratel.rs/uploads/documents/empire_plugin/An%20Overview%20Of%20The%20Telecom%20And%20Postal%20Services%20Market%20In%20The%20Republic%20Of%20Serbia%20In%202018.pdf).

<sup>584</sup> [www.ratel.rs/uploads/documents/empire\\_plugin/An%20Overview%20Of%20The%20Telecom%20And%20Postal%20Services%20Market%20In%20The%20Republic%20Of%20Serbia%20In%202018.pdf](http://www.ratel.rs/uploads/documents/empire_plugin/An%20Overview%20Of%20The%20Telecom%20And%20Postal%20Services%20Market%20In%20The%20Republic%20Of%20Serbia%20In%202018.pdf).

<sup>585</sup> <http://benchmark.ratel.rs/en/trend-analysis-2019>.

<sup>586</sup> [www.ratel.rs/uploads/documents/empire\\_plugin/An%20Overview%20Of%20The%20Telecom%20And%20Postal%20Services%20Market%20In%20The%20Republic%20Of%20Serbia%20In%202018.pdf](http://www.ratel.rs/uploads/documents/empire_plugin/An%20Overview%20Of%20The%20Telecom%20And%20Postal%20Services%20Market%20In%20The%20Republic%20Of%20Serbia%20In%202018.pdf).

<sup>587</sup> [www.itu.int/en/ITU-D/Statistics/Documents/statistics/2019/CoreHouseholdIndicators.xlsx](http://www.itu.int/en/ITU-D/Statistics/Documents/statistics/2019/CoreHouseholdIndicators.xlsx).

<sup>588</sup> Information provided by UNICEF Serbia Country Office; see [www.stat.gov.rs/en-us/oblasti/upotreba-ikt/upotreba-ikt-domacinstva/](http://www.stat.gov.rs/en-us/oblasti/upotreba-ikt/upotreba-ikt-domacinstva/) and <https://publikacije.stat.gov.rs/G2018/Pdf/G201816013.pdf>.

<sup>589</sup> [www.itu.int/en/ITU-D/Innovation/Documents/Publications/eBAT\\_Brochure%E2%80%933DIP%20Serbia\\_432746.pdf](http://www.itu.int/en/ITU-D/Innovation/Documents/Publications/eBAT_Brochure%E2%80%933DIP%20Serbia_432746.pdf).

<sup>590</sup> ITU World Telecommunication/ICT Indicators Database online (2020), available at <http://handle.itu.int/11.1002/pub/81550f97-en> (indicator i911mw).

<sup>591</sup> [www.itu.int/en/ITU-D/Regional-Presence/Europe/Documents/Events/2019/Regulatory%20Forum/5.%20RATEL%205G%20in%20Serbia%20-%20challenges%20and%20opportunities.pdf](http://www.itu.int/en/ITU-D/Regional-Presence/Europe/Documents/Events/2019/Regulatory%20Forum/5.%20RATEL%205G%20in%20Serbia%20-%20challenges%20and%20opportunities.pdf).

<sup>592</sup> [www.ratel.rs/uploads/documents/empire\\_plugin/Q1%202021%20Electronic%20Communications.pdf](http://www.ratel.rs/uploads/documents/empire_plugin/Q1%202021%20Electronic%20Communications.pdf).

used on average 240 MB daily, or around 7.27 GB a month.<sup>593</sup> In total, mobile-broadband Internet traffic within Serbia in 2020 was around 0.46 EB.<sup>594</sup> Furthermore, according to data from RATEL published in its market overview for 2019, all three mobile network operators have high 3G and 4G/LTE mobile network coverage, reaching between 95.65 per cent and 96.86 per cent of the population and between 72.31 per cent and 78.99 per cent of the territory of the Republic of Serbia.<sup>595</sup>

Based on the 2010 Electronic Communications Act (arts. 52 and 53), amended in 2014,<sup>596</sup> and the 2015 rules on the method for collecting and publishing data on the type, availability and geographical location of electronic communication network infrastructure, as well as in line with the EU's Broadband Cost Reduction Directive, RATEL established an infrastructure mapping system in late 2016<sup>597</sup> with the expectation of optimizing infrastructure deployment through better planning and cost-sharing to accelerate the development of next generation networks in a competitive and efficient way.<sup>598</sup> The data, which are requested from operators, include four main criteria: (i) type (e.g. cables, other ground equipment, antenna towers, masts); (ii) availability; (iii) geographical location; and (iv) whether they are for shared use or access only.<sup>599</sup> As a result, the data are displayed through a geographic information systems web application to which only operators and RATEL have access. RATEL's current plans include an extension to reach all electronic communication infrastructure, the creation of synergies for co-deployment with other sectors (power distribution, geodesy), guidelines for infrastructure sharing, and an overall open-data approach. At the moment, no service mapping or investment mapping is planned.<sup>600</sup>

The preparation of preliminary maps of the availability of broadband access in settlements across Serbia has been completed, based on data obtained from electronic communications operators. The results show that there are slightly more than half a million households in rural areas with no economic interest for operators to develop next generation infrastructure ("white and grey NGA zones").<sup>601</sup>

### 3.7.2 Government strategies, status of education quality, and the role of ICTs

In October 2012, the Government of the Republic of Serbia adopted a Strategy for Education Development in Serbia up to 2020.<sup>602</sup> This document focuses on making pupils literate for life in the modern world and complies with a holistic and open approach to education and

<sup>593</sup> [www.ratel.rs/uploads/documents/empire\\_plugin/Q1%202021%20Electronic%20Communications.pdf](http://www.ratel.rs/uploads/documents/empire_plugin/Q1%202021%20Electronic%20Communications.pdf).

<sup>594</sup> ITU World Telecommunication/ICT Indicators Database online (2020), available at <http://handle.itu.int/11.1002/pub/81550f97-en> (indicator i136mwi).

<sup>595</sup> Furthermore, according to data from RATEL published in its market overview for 2019, all three mobile network operators have high 3G and 4G/LTE mobile network coverage, covering between 95.65 per cent and 96.86 per cent of the population and between 72.31 per cent and 78.99 per cent of the territory of the Republic of Serbia. For more information

<sup>596</sup> [www.ratel.rs/upload/documents/Zakon/Electronic%20Communications%20Law.pdf](http://www.ratel.rs/upload/documents/Zakon/Electronic%20Communications%20Law.pdf).

<sup>597</sup> <https://eki.ratel.rs/ratel/login.jsp>.

<sup>598</sup> [www.itu.int/en/ITU-D/Regional-Presence/Europe/Documents/Events/2016/Broadband%20Mapping/3.%20Ivkovic%20Measuring%20QoS%20and%20Mapping%20of%20Shared%20Infrastructure%209%2004%202016.pdf](http://www.itu.int/en/ITU-D/Regional-Presence/Europe/Documents/Events/2016/Broadband%20Mapping/3.%20Ivkovic%20Measuring%20QoS%20and%20Mapping%20of%20Shared%20Infrastructure%209%2004%202016.pdf).

<sup>599</sup> [www.itu.int/en/ITU-D/Regional-Presence/Europe/Documents/Events/2020/RRF/Session%204\\_Branko%20Mirkovic\\_EC%20mapping%20infrastructure%20%281%29.pdf](http://www.itu.int/en/ITU-D/Regional-Presence/Europe/Documents/Events/2020/RRF/Session%204_Branko%20Mirkovic_EC%20mapping%20infrastructure%20%281%29.pdf).

<sup>600</sup> [www.itu.int/en/ITU-D/Regional-Presence/Europe/Documents/Events/2020/RRF/20-11-26%20Background%20Paper\\_Broadband%20Mapping%20Systems%20in%20Europe%20and%20Regional%20Harmonization%20Initiatives\\_final.pdf](http://www.itu.int/en/ITU-D/Regional-Presence/Europe/Documents/Events/2020/RRF/20-11-26%20Background%20Paper_Broadband%20Mapping%20Systems%20in%20Europe%20and%20Regional%20Harmonization%20Initiatives_final.pdf).

<sup>601</sup> <https://pristupinternetu.mtt.gov.rs/portal/apps/sites/#/mttt-fiksna-pokrivenost>.

<sup>602</sup> [www.mpn.gov.rs/wp-content/uploads/2015/08/strategija\\_obrazovanja\\_do\\_2020.pdf](http://www.mpn.gov.rs/wp-content/uploads/2015/08/strategija_obrazovanja_do_2020.pdf).

its development.<sup>603</sup> Emphasis is placed on developing enriching teaching and extracurricular activities (including scientific, technical and entrepreneurial activities, as well as media literacy) and improving the quality of teacher training.<sup>604</sup> The strategy acknowledges the need to continue equipping schools with computers and Internet connections. Given the gap between cities and villages in Serbia, the strategy encourages the use of resources provided by school libraries and pushes for communication technologies to be used in teaching/learning.<sup>605</sup> According to the strategy, the most important goals in education include:

- Increasing the quality of educational processes and outcomes to the maximum attainable level;
- Increasing population coverage at all education levels;
- Achieving and maintaining the relevance of education and aligning the education system's structure with the needs of individuals and those of the economic, social, cultural, research, education, public, administrative and other systems;
- Increasing overall effectiveness in the use of education resources.

Despite the Government's focus on ICT equipment, connectivity and the introduction of e-textbooks and related professional development for teachers, as outlined in previous sections of this report, substantial and coherent links between digital reform and other key educational reforms, specifically curriculum reforms, remain undefined. Nonetheless, some efforts to integrate digital skills into the existing curriculum are notable, including the addition of compulsory IT subjects in lower secondary education and the introduction of "The Digital World" as a subject in primary education. While the Government has taken considerable steps toward improving equitable access to ICT infrastructure for schools, teachers and students, and to devices, especially for children from vulnerable populations, other actions to ensure that digitalization of the education sector is coordinated with overall educational improvement—i.e. further developing the legal and strategic framework for digital learning, increasing the availability of high-quality digital learning resources, and strengthening teachers' competencies for digital and distance instruction, including their knowledge of hybrid and distance learning theories and the availability of professional materials related to educational technology and instructional design—remain to be strengthened.

A Strategy for Education Development in the Republic of Serbia up to 2030 was adopted in 2021.<sup>606</sup> One of its key objectives, as embodied in goal 1.3, is to "establish foundations for the development of digital education at the pre-university level". More specifically regarding the development of digital pre-university education, the focus will be on supporting institutions in pre-university education to improve not only the digital competencies of students, but also the digital competencies of education employees through the implementation and promotion of innovative approaches that include integrating ICTs into teaching and learning. During the implementation of the Strategy, support will be provided to help schools organize hybrid and online teaching so that systemic measures can be taken. In addition, a set of indicators for

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<sup>603</sup> [https://eacea.ec.europa.eu/national-policies/eurydice/content/ongoing-reforms-and-policy-developments-58\\_en](https://eacea.ec.europa.eu/national-policies/eurydice/content/ongoing-reforms-and-policy-developments-58_en).

<sup>604</sup> [www.uhr.se/globalassets/uhr.se/internationellt/eurydice/digital-education-at-schools-in-europe\\_eurydice-report.pdf](http://www.uhr.se/globalassets/uhr.se/internationellt/eurydice/digital-education-at-schools-in-europe_eurydice-report.pdf).

<sup>605</sup> [www.uhr.se/globalassets/uhr.se/internationellt/eurydice/digital-education-at-schools-in-europe\\_eurydice-report.pdf](http://www.uhr.se/globalassets/uhr.se/internationellt/eurydice/digital-education-at-schools-in-europe_eurydice-report.pdf).

<sup>606</sup> Information provided by the Serbia UNICEF Country Office. For the Strategy, see [www.mpn.gov.rs/wp-content/uploads/2021/02/1-SROVRS-2030\\_MASTER\\_0402\\_V1.pdf](http://www.mpn.gov.rs/wp-content/uploads/2021/02/1-SROVRS-2030_MASTER_0402_V1.pdf).



the long-term monitoring of digital education development will be defined, with the aim of establishing a system of continuous monitoring of the development of digital education.<sup>607</sup>

According to 2018 OECD PISA results,<sup>608</sup> students in Serbia scored lower than the OECD average in reading, mathematics and science.<sup>609</sup> The results also indicated that mean performance in reading and mathematics had improved since the country first participated in PISA in 2006; however, performance in science remained stable, on average. Across all three subjects, improvements were more marked among the highest-achieving students, and a widening of performance gaps was observed.<sup>610</sup> Following the same trend found in other Western Balkan countries, socio-economically advantaged students outperformed disadvantaged students in reading by 73 points. This is less than the average difference between the two groups (89 points) across OECD countries.

In comparison to neighbouring countries, Serbia saw students achieve higher results in all three domains, even if the results were worse than in 2012, albeit with no statistically significant difference.<sup>611</sup> More importantly, Serbia has the highest share of students who have level 4 proficiency or above in reading.<sup>612</sup> In terms of school governance, PISA revealed that Serbia reported fewer staff shortages and more material shortages than the OECD average, but there was no significant difference in staff shortages between advantaged and disadvantaged schools.<sup>613</sup> A 2019 report by the European Commission shows that some progress was made in increasing the participation of disadvantaged students at all levels of education in Serbia. However, the implementation of measures to reduce dropout rates and segregation has yet to be strengthened. An action plan on inclusive education has yet to be adopted.<sup>614</sup>

In terms of the national curriculum, the Government recognizes that it is extensive, inflexible, and applied uniformly without taking into account local conditions. Moreover, the concept of elective courses is neither well developed nor fully implemented. Although ongoing curricular reforms have introduced the addition of learning outcomes to the curriculum for each subject and grade, along with learning standards at the end of each education cycle, programmes continue to list topics and contents with little correlation between subjects. This prevents the integration of content and thematic teaching.<sup>615</sup> While the development of cross-curricular competencies is fairly new, there is a long tradition of integrating digital competencies into other subjects, and this approach is now also supported by national strategies.<sup>616</sup>

<sup>607</sup> Information provided by the Ministry of Education, Science and Technological Development.

<sup>608</sup> PISA tests the reading, mathematics and science performance of 15-year-old pupils across the world every three years. In the context of the European Union, PISA results are particularly important because they feed into the Education and Training 2020 strategic cooperation framework (ET2020). They form the basis for one of the ET2020 benchmarks: the rate of underachievers in reading, mathematics or science among 15-year-olds in the EU should be less than 15 per cent by 2020. Underachievers in PISA are those pupils who fail to reach the minimum proficiency level necessary to participate successfully in society. More information on the PISA indicators and ET2020 is available at [https://ec.europa.eu/education/sites/education/files/document-library-docs/pisa-2018-eu\\_1.pdf](https://ec.europa.eu/education/sites/education/files/document-library-docs/pisa-2018-eu_1.pdf).

<sup>609</sup> [www.oecd.org/pisa/publications/PISA2018\\_CN\\_SRB.pdf](http://www.oecd.org/pisa/publications/PISA2018_CN_SRB.pdf).

<sup>610</sup> [www.oecd.org/pisa/publications/PISA2018\\_CN\\_SRB.pdf](http://www.oecd.org/pisa/publications/PISA2018_CN_SRB.pdf).

<sup>611</sup> [www.oecd-ilibrary.org/sites/a8c72f1b-en/1/3/10/6/index.html?itemId=/content/publication/a8c72f1b-en&csp=762150f8ebcc22b4a63f8aec03e7faf9&itemIGO=oecd&itemContentType=book](http://www.oecd-ilibrary.org/sites/a8c72f1b-en/1/3/10/6/index.html?itemId=/content/publication/a8c72f1b-en&csp=762150f8ebcc22b4a63f8aec03e7faf9&itemIGO=oecd&itemContentType=book).

<sup>612</sup> [www.oecd-ilibrary.org/sites/a8c72f1b-en/1/3/10/6/index.html?itemId=/content/publication/a8c72f1b-en&csp=762150f8ebcc22b4a63f8aec03e7faf9&itemIGO=oecd&itemContentType=book](http://www.oecd-ilibrary.org/sites/a8c72f1b-en/1/3/10/6/index.html?itemId=/content/publication/a8c72f1b-en&csp=762150f8ebcc22b4a63f8aec03e7faf9&itemIGO=oecd&itemContentType=book).

<sup>613</sup> [www.oecd.org/pisa/publications/PISA2018\\_CN\\_SRB.pdf](http://www.oecd.org/pisa/publications/PISA2018_CN_SRB.pdf).

<sup>614</sup> <https://ec.europa.eu/neighbourhood-enlargement/sites/near/files/20190529-serbia-report.pdf>.

<sup>615</sup> <https://epale.ec.europa.eu/en/resource-centre/content/strategy-education-development-serbia-2020>.

<sup>616</sup> [www.uhr.se/globalassets/\\_uhr.se/internationalt/eurydike/digital-education-at-schools-in-europe\\_eurydice-report.pdf](http://www.uhr.se/globalassets/_uhr.se/internationalt/eurydike/digital-education-at-schools-in-europe_eurydice-report.pdf).

Through the Digital School project, which was launched by the Serbian Government in 2008, about 95 per cent of schools (2 808) obtained a computer-equipped classroom.<sup>617</sup> However, many schools, particularly in underdeveloped areas, still have no computers or Internet connections, nor do children have access at home, particularly in rural areas. An OECD-led assessment revealed that approximately 9 per cent of 15-year-old students did not have a desktop computer available to use at home.<sup>618</sup> Similarly, 17 per cent of 15-year-olds in Serbia did not have a portable laptop or other device available to use at home, while about 3 per cent did not have an Internet connection available to use at home.<sup>619</sup>

According to Serbia's Statistical Office, in rural areas in 2020, 38 per cent of all households owned a computer – mainly households with a monthly income of EUR 600 or more (95.7 per cent). This figure falls to 48 per cent for households with an income of less than EUR 300. The gap between urban and rural areas was large and had slightly increased relative to 2019 (the rate of growth in the number of computers in urban areas was 2.1 per cent but had decreased by 0.3 per cent in rural areas).<sup>620</sup> Moreover, the gap did not only extend to ICTs. According to data from the Serbian Government, only two-thirds of schools in the country had libraries at the time.<sup>621</sup>

With the adoption of the 2017 Act on the Foundations of the Education System<sup>622</sup> and the 2018 Higher Education Act, the Serbian Government devised a unified education information system, which contains four important data points relevant to school mapping: (i) a register of institutions; (ii) a register of employees; (iii) a register of children, students and adults; and (iv) a register of accredited study programmes. The system was developed in the early 2000s as the Ministry of Education, Science and Technological Development's official education management information system.<sup>623</sup> Although not fully completed and functional, this system will keep school records, with students assigned a unique education number. This number serves as a unique identifier for each child, student and adult in the education system, enabling schools to officially anonymize data on children, students and adults. The type of data stored in the system and how the data should be used, updated and kept secure is regulated by national laws on education.<sup>624</sup>

Another purpose of the unique education number is to assure the quality of data used for the calculation of statistical indicators, which, in turn, will be used to evaluate the education system.<sup>625</sup> In 2018 the "My e-Diary" portal was developed, and it was one of the measures that enabled the Serbian education system to adapt to distance learning quickly.<sup>626</sup> The portal keeps a record of school work, as well as records of students' achievements and behaviour. This measure was presented by the Government as beneficial to parents, too, as it gives them constant insight into the success and conduct of their children, introduces more transparency

<sup>617</sup> <https://globalvoices.org/2010/08/06/serbia-digital-school-project/>.

<sup>618</sup> [www.wb6cif.eu/wp-content/uploads/2020/05/Strategic-Response-to-Covid-19-in-SEE.pdf](http://www.wb6cif.eu/wp-content/uploads/2020/05/Strategic-Response-to-Covid-19-in-SEE.pdf).

<sup>619</sup> [www.wb6cif.eu/wp-content/uploads/2020/05/Strategic-Response-to-Covid-19-in-SEE.pdf](http://www.wb6cif.eu/wp-content/uploads/2020/05/Strategic-Response-to-Covid-19-in-SEE.pdf).

<sup>620</sup> Information provided by UNICEF Serbia Country Office; see <https://www.stat.gov.rs/en-us/oblasti/upotreba-ikt/upotreba-ikt-domacinstva/>.

<sup>621</sup> <https://epale.ec.europa.eu/en/resource-centre/content/strategy-education-development-serbia-2020>.

<sup>622</sup> [https://eacea.ec.europa.eu/national-policies/eurydice/content/organisation-education-system-and-its-structure-66\\_en](https://eacea.ec.europa.eu/national-policies/eurydice/content/organisation-education-system-and-its-structure-66_en).

<sup>623</sup> [www.oecd-ilibrary.org/docserver/d8a85cfe-en.pdf?expires=1605971126&id=id&accname=guest&checksum=71BFD5192275F03E6FB581AD5A8D697C](http://www.oecd-ilibrary.org/docserver/d8a85cfe-en.pdf?expires=1605971126&id=id&accname=guest&checksum=71BFD5192275F03E6FB581AD5A8D697C).

<sup>624</sup> Ministry of Education, Science and Technological Development, OECD Review of Evaluation and Assessment: Country Background Report for Serbia (Belgrade, 2018).

<sup>625</sup> [https://china-cee.eu/wp-content/uploads/2020/06/2020s05\\_Serbia.pdf](https://china-cee.eu/wp-content/uploads/2020/06/2020s05_Serbia.pdf).

<sup>626</sup> [www.kt.gov.rs/en/news/news-archive/schools-in-serbia-introduce-e-dairies-on-september-1/](http://www.kt.gov.rs/en/news/news-archive/schools-in-serbia-introduce-e-dairies-on-september-1/).

and reduces the need to physically go to their children's schools for information. By 2019, My e-Diary had been introduced in all schools in Serbia.<sup>627</sup>

However, there are challenges around national data collection. Before 2018, Serbia had not conducted a national assessment since 2006. Even when information is available, the lack of staff with relevant experience hinders comprehensive system evaluation.<sup>628</sup> As assessed by the OECD, the monitoring and evaluation of Serbia's education strategy and action plan is not a systematic process.<sup>629</sup> However, a 2019 progress report on the Action Plan for the Implementation of the Strategy for Education Development in Serbia up to 2020, together with similar reports for the previous two reporting periods, are publicly available.<sup>630</sup>

Serbia's is among the few European education systems that have developed specific frameworks dealing with the digital competencies of teachers (Spain, Croatia, Lithuania, Austria, Norway and Serbia) or setting standards (Estonia and Ireland). In Serbia, the definition in the national digital competency framework puts the emphasis on the educational uses of technology.<sup>631</sup> The framework seeks to ensure the deliberate, flexible and safe use of ICTs, as well as to improve teaching and learning processes and activities in both online and off-line environments.<sup>632</sup> As mentioned above, a new Strategy for Education Development up to 2030 was adopted in 2021.<sup>633</sup>

Other notable government strategies regarding the role of ICTs and digital inclusion are: the Strategy to Improve the Situation of Persons with Disabilities in the Republic of Serbia 2020-2024, which includes a component on digital inclusion; the Strategy on the Development of the Information Society in the Republic of Serbia up to 2020; the Strategy for Violence Prevention and the Protection of Children from Violence 2020-2023, which includes priorities for protecting children from digital violence; the Strategy for the Development of Next-Generation Networks up to 2023, which states that fibre-optic technology should be the backbone of the broadband network in Serbia; and the Strategy for the Development of Digital Skills in the Republic of Serbia 2020-2024, which contributes to increasing access of citizens and businesses to ICTs, the openness and accessibility of the Internet, and digital education.<sup>634</sup>

### 3.7.3 Multistakeholder partnerships and financing mechanisms fostering investment in school connectivity

The Serbian Government has, over the past few years, provided computers and Internet connectivity to a number of schools across the country. Since 2017, in a collaboration between the Ministry of Education, Science and Technological Development and the Ministry of Trade, Tourism and Telecommunications, the Government has been implementing the Connected Schools project,<sup>635</sup> which was an ITU WSIS Prize contest nominee in 2020. The project focuses on developing ICT infrastructure for educational institutions by providing fast, stable and secure

<sup>627</sup> [www.mpn.gov.rs/wp-content/uploads/2019/08/Progress-Report-on-The-Action-Plan-for-the-Implementation-of-The-Strategy-for-Education-Development-in-Serbia-by-2020-for-2018.pdf](http://www.mpn.gov.rs/wp-content/uploads/2019/08/Progress-Report-on-The-Action-Plan-for-the-Implementation-of-The-Strategy-for-Education-Development-in-Serbia-by-2020-for-2018.pdf).

<sup>628</sup> Ministry of Education, Science and Technological Development, OECD Review of Evaluation and Assessment: Country Background Report for Serbia (Belgrade, 2018).

<sup>629</sup> [www.oecd-ilibrary.org/sites/72483fab-en/index.html?itemId=/content/component/72483fab-en](http://www.oecd-ilibrary.org/sites/72483fab-en/index.html?itemId=/content/component/72483fab-en).

<sup>630</sup> [www.mpn.gov.rs/strategije-2020/](http://www.mpn.gov.rs/strategije-2020/).

<sup>631</sup> [www.mpn.gov.rs/wp-content/uploads/2017/04/Okvir-digitalnih-kompetencija-Final-1.pdf](http://www.mpn.gov.rs/wp-content/uploads/2017/04/Okvir-digitalnih-kompetencija-Final-1.pdf).

<sup>632</sup> [www.uhr.se/globalassets/uhr.se/internationalt/eurydice/digital-education-at-schools-in-europe\\_eurydice-report.pdf](http://www.uhr.se/globalassets/uhr.se/internationalt/eurydice/digital-education-at-schools-in-europe_eurydice-report.pdf).

<sup>633</sup> [https://eacea.ec.europa.eu/national-policies/eurydice/content/legislation-58\\_en](https://eacea.ec.europa.eu/national-policies/eurydice/content/legislation-58_en).

<sup>634</sup> Information provided by the Ministry of Education, Science and Technological Development.

<sup>635</sup> <https://pametnoibezbedno.gov.rs/projekat/6/>.

Internet access through the Academic Network of the Republic of Serbia (AMRES)<sup>636</sup> to all users within these institutions.

The project supports the national digital education investment programme by improving digital infrastructure and teaching materials in schools, notably through the provision of new digital equipment, the upgrading of the academic network and central locations, and the rollout of wireless local area networks (WLANs), as well as by providing teachers with training in digital skills. The project also envisions the development of teaching materials and teacher training in ICTs and digital skills, as mandated by the new education curricula approved by the Serbian Government. The overall result anticipates an improvement in youth employability.<sup>637</sup>

The project's overarching goal is to connect all elementary and secondary schools in the country, which includes providing WLAN for over 4 000 base schools and detached school units, encompassing approximately 850 000 students.<sup>638</sup> Despite these efforts, many schools, especially in rural areas far from urban centres, will not be covered by this project.<sup>639</sup> By June 2021, the project has enabled Internet access in more than 900 schools across Serbia, reaching about 19 500 classrooms and over 470 000 additional students, who represent around 61 of the current student population.<sup>640</sup> According to public information, 22 per cent use dark fibre (including 1G optical cables to gymnasiums) and 47 per cent use DSL with a speed of 20 Mb to connect with the AMRES network. The remainder (31 per cent) are connected via mobile networks, especially schools in rural and mountainous areas of Serbia. By the end of 2021, WLANs will be provided in all schools across the country, including base schools and detached school units.<sup>641</sup> As an inter-ministerial project, Connected Schools<sup>642</sup> is receiving EUR 70 million in support from the European Investment Bank EIB as part of its total funding of around EUR 111 million.

In a partnership with the Serbian Government that sees it taking on the role of primary connectivity provider for all Serbian schools, AMRES is further participating in two pilot projects: "e-education" and "Wi-Fi for Schools". These projects leverage experience gained as a connectivity provider.

In e-education, AMRES is providing the technical infrastructure for newly tested software for school information systems (to provide information such as online class attendance, test results, and reporting for parents). This pilot is run by the Ministry of Education, Science and Technological Development, and 100 schools are currently participating; there are plans to increase the total number to 200 schools by the end of the year.<sup>643</sup>

In Wi-Fi for Schools, AMRES piloted a roll-out of wireless networks to about 40 schools in 2016, which in its first iteration was limited to providing Wi-Fi access to teachers. Since then, the AMRES project has provided 934 schools with wireless networks, and it aims to connect

<sup>636</sup> [www.geant.org/News\\_and\\_Events/CONNECT/Pages/AMRES.aspx](http://www.geant.org/News_and_Events/CONNECT/Pages/AMRES.aspx).

<sup>637</sup> [www.eib.org/en/projects/pipelines/all/20170979](http://www.eib.org/en/projects/pipelines/all/20170979).

<sup>638</sup> <https://www.itu.int/net4/wsis/stocktaking/prizes/2020/>.

<sup>639</sup> [www.unicef.org/serbia/sites/unicef.org.serbia/files/2019-11/School\\_Mapping\\_Consultant.pdf](http://www.unicef.org/serbia/sites/unicef.org.serbia/files/2019-11/School_Mapping_Consultant.pdf).

<sup>640</sup> [www.ekapija.com/en/news/2892115/preparation-of-computer-network-in-schools-in-serbia-begins-wireless-Internet-in](http://www.ekapija.com/en/news/2892115/preparation-of-computer-network-in-schools-in-serbia-begins-wireless-Internet-in).

<sup>641</sup> <https://www.itu.int/net4/wsis/stocktaking/prizes/2020/>.

<sup>642</sup> [www.eib.org/attachments/registers/95388161.pdf](http://www.eib.org/attachments/registers/95388161.pdf).

<sup>643</sup> [www.geant.org/News\\_and\\_Events/CONNECT/Pages/AMRES.aspx](http://www.geant.org/News_and_Events/CONNECT/Pages/AMRES.aspx).

a further 950 in 2021.<sup>644</sup> “Bring Your Own Device” scenarios are being tested to enable Wi-Fi access to be provided to more users and a wider community.<sup>645</sup>

These two pilot projects target different schools with different technical setups, allowing AMRES to assess the most suitable infrastructure set-up and providing insight into whether, for example, symmetric links are sufficient, or whether fibre would be required to provide such services to all schools. Among services in the planning phase for roll-out in schools is eduroam. Currently, technical feasibility is being assessed, with initial access limited to teachers only. In the future, there is a plan to broaden the authentication process so that not only teachers but also students will be able to connect to eduroam.<sup>646</sup>

Additionally, the “Next Generation Broadband Connectivity for Rural Schools in White Zones” project was planned through the Western Balkans Investment Framework. Bilateral donors provided EUR 1.7 million for technical assistance to allow Serbia to finance the design of fibre-optic broadband infrastructure in rural regions of the country. Construction of this infrastructure will be financed by a loan of EUR 18 million from the European Bank for Reconstruction and Development.<sup>647</sup>

This project will enable infrastructure development and the interconnection of existing operators’ networks and schools in rural (“white”) zones. Schools will obtain fibre-optic connectivity (1 Gbit/s or more), while neighbouring households (private investment following middle-mile capital expenditure investment by the Government) will gain 30 Mbit/s connectivity or better.<sup>648</sup> According to the project plans, the following results and benefits are expected:

- Completion of detailed fixed-broadband availability mapping in intervention areas (already conducted);
- Connection of rural/white zone schools to broadband with appropriate speed (600 schools in the second phase and 900 in the third phase);
- Provision of next-generation (above 30 Mbit/s) connectivity to households in rural/white zones (90 000 households in the second phase and 135 000 households in the third phase);
- Improvement of education quality in schools, employment of IT teachers, and integration of Internet usage training into everyday schoolwork for students in rural/white zones;
- Improvement of the quality of life in rural areas through better access to services and information, with broadband connection enabled at an appropriate speed.

School connectivity and ICT infrastructure support in educational institutions has also involved the support of telecommunication operators in the country. In September 2019, Telekom Srbija announced donations of IT equipment to Serbian elementary schools as part of a project entitled “We Create Knowledge”, which was carried out for the third year in a row in cooperation with the Ministry of Education, Science and Technological Development. Between 2016 and 2019, the project has equipped classrooms in 60 elementary schools throughout Serbia.<sup>649</sup>

<sup>644</sup> [www.itu.int/en/ITU-D/Regional-Presence/Europe/Documents/Events/2021/Meaningful%20Connectivity/03\\_Dobrijevic.pdf](http://www.itu.int/en/ITU-D/Regional-Presence/Europe/Documents/Events/2021/Meaningful%20Connectivity/03_Dobrijevic.pdf).

<sup>645</sup> [www.geant.org/News\\_and\\_Events/CONNECT/Pages/AMRES.aspx](http://www.geant.org/News_and_Events/CONNECT/Pages/AMRES.aspx).

<sup>646</sup> [www.geant.org/News\\_and\\_Events/CONNECT/Pages/AMRES.aspx](http://www.geant.org/News_and_Events/CONNECT/Pages/AMRES.aspx).

<sup>647</sup> [www.ebrd.com/news/2021/ebd-and-wbif-support-serbia-to-expand-broadband-to-rural-areas.html](http://www.ebrd.com/news/2021/ebd-and-wbif-support-serbia-to-expand-broadband-to-rural-areas.html).

<sup>648</sup> <https://wbif.eu/project/PRJ-SRB-DII-005>.

<sup>649</sup> <https://mts.rs/About-Telekom/Media-center/a88155-Telekom-Srbija-equips-another-20-IT-classrooms-in-Serbian-schools-Computer-equipment-donated-to-Elementary-School-Milan-Munjas-in-Ub.html>.

In addition, a joint UNICEF-EU project, “Bridging the digital divide in Serbia for the most vulnerable children”, provides the Government with support in improving the policy and regulatory framework on digital learning and adjusting the EMIS to make it fit for and supportive of digital transformation. At the same time, the project focuses on further developing the online national learning platform and strengthening IT infrastructure through the provision of central servers.<sup>650</sup> Importantly, the project also focuses on the integral role that schools play in the digital transition of education and society, and UNICEF is supporting schools to create their own educational technology libraries for access by the most marginalized learners, in particular, and to further strengthen teacher capacity-building on digital learning. These efforts include the establishment of learning clubs in selected at-risk schools, with additional psycho-social support services.<sup>651</sup> To enable the uptake of digital learning in school development and practice and to develop digital learning plans, the strategy involves establishing support systems for education institutions, school authorities and teachers, as well as efforts to strengthen national structures for implementing mentoring, peer learning and quality monitoring for curriculum implementation and digital skills.<sup>652</sup> UNICEF advocates for Internet connectivity for all schools through investment funds and a European Investment Bank loan and works with the private-sector Telenor group to provide free Internet access for educational purposes for children, especially the most vulnerable.<sup>653</sup> Together, these efforts aim to strengthen the country’s digital learning ecosystem.

The British Council has served as another example of donor partnerships with the Serbian Ministry of Education, Science and Technological Development, notably through the Schools for the 21<sup>st</sup> Century initiative.<sup>654</sup>

### 3.7.4 National responses to COVID-19 and pedagogic initiatives for distance education

In mid-March 2020, all education institutions closed in Serbia—pre-school education, elementary and secondary schools, vocational education and training establishments, and higher education institutions.<sup>655</sup> In a rapid and adaptive response, the Ministry of Education, Science and Technological Development came up with extensive projects to address the disruptions caused by COVID-19. The Government launched a centralized website intended to provide support to students, teachers and parents and to help overcome the COVID-19 emergency, including timely information on the schedule for broadcasting educational content and other relevant initiatives that contribute to the achievement of the intended teaching and learning outcomes.<sup>656</sup>

The Ministry envisages and supports the implementation of educational activities through various channels and forms of communication:<sup>657</sup>

- By broadcasting specially prepared and adapted educational content for primary school students on the RTS 2 and RTS 3 television channels of the country’s public broadcasting service, Radio-televizija Srbije (RTS), as well as in local media in the languages of national minorities;

<sup>650</sup> UNICEF Europe and Central Asia Region COVID-19 response in education questionnaire, March 2021.

<sup>651</sup> UNICEF Country Office response to Reimagine Education questionnaire.

<sup>652</sup> UNICEF Country Office response to Reimagine Education questionnaire.

<sup>653</sup> UNICEF Europe and Central Asia Region COVID-19 response in education questionnaire, March 2021.

<sup>654</sup> Information provided by the Ministry of Education, Science and Technological Development.

<sup>655</sup> For more information please check [www.ei-ie.org/en/detail](http://www.ei-ie.org/en/detail).

<sup>656</sup> [www.rasporednastave.gov.rs](http://www.rasporednastave.gov.rs).

<sup>657</sup> [www.rasporednastave.gov.rs](http://www.rasporednastave.gov.rs).

- By establishing a repository of educational video content for primary and secondary school students on the free RTS application *Moja škola* ("My school") for mobile phones, on the RTS website and on the multimedia Internet platform RTS Planet; and
- By making a set of tools available for online communication between students and teachers.

As a result, the Government reports that 770 000 students from 3 744 elementary and secondary school units (including satellite campuses and branches) in Serbia moved to distance learning through RTS.<sup>658</sup> UNICEF has supported the Ministry in these efforts to enable teachers to develop television lessons by procuring relevant software for the recording of lessons, ICT equipment, and video editing services.<sup>659</sup>

According to a monitoring report by OECD, Serbia requires schools to provide any students who lack home computers with printed materials or school resources, such as computers or tablets.<sup>660</sup> Nonetheless, a report on the participation and learning of students from vulnerable groups during distance learning in Serbia<sup>661</sup> noted that most schools referred to a lack of technical resources needed for distance learning as a significant challenge for Roma students, which most often involved the unavailability of devices or lack of Internet access, as well as a lack of digital skills needed to participate in distance learning. For example, 99 per cent of children were covered by distance learning through either television broadcasts, online platforms or alternative learning avenues. Despite these efforts in distance learning, data indicate that 17 per cent of Roma children in primary school have not been able to participate in distance learning because of a lack of appropriate equipment and lack of learning support, among other reasons.<sup>662</sup> The same report also noted that additional support was made available to the most vulnerable students. For example, approximately 90 per cent of teachers communicated via phone calls with primary-age Roma students and their families. Approximately 93 per cent of primary-age students and 92 per cent of secondary-age students with disabilities who receive support under regular circumstances through individual education plans received support through individualized approaches to learning during the state of emergency. Most often this involved adjusting contents and materials for distance learning and adjusting distance learning assignments or instructions to align with students' learning outcomes, as well as preparing instructions for caregivers to support students with disabilities.<sup>663</sup>

Moreover, UNICEF has supported efforts to reach the farthest behind, such as by providing digital equipment to three reception and asylum centres to support formal education and learning for children on the move, including language and digital skills development, in cooperation with the Akelius Foundation.<sup>664</sup> These efforts have included capacity-strengthening for teachers and mentors to provide additional learning and support for children on the move.

<sup>658</sup> <http://europa.rs/eu-support-to-distance-and-online-education-in-serbia/?lang=en>.

<sup>659</sup> <https://www.unicef.org/media/88896/file/ECARO-COVID-19SitRepNo.15-22Oct-25Nov2020.pdf>; <https://infogram.com/1ppmyx2xep3yegbrdm5xzdvw6quz6lwz1rp?live>.

<sup>660</sup> [www.wb6cif.eu/wp-content/uploads/2020/05/Strategic-Response-to-Covid-19-in-SEE.pdf](http://www.wb6cif.eu/wp-content/uploads/2020/05/Strategic-Response-to-Covid-19-in-SEE.pdf).

<sup>661</sup> Ministry of Education, Science and Technological Development of the Republic of Serbia, Institute of Psychology and UNICEF, *Praćenje načina učešća i procesa učenja učenika iz osetljivih grupa tokom ostvarivanja obrazovno-vaspitnog rada učenjem na daljinu* ("Monitoring the participation and learning process of students from vulnerable groups during online education") (2020).

<sup>662</sup> Information provided by UNICEF Serbia Country Office.

<sup>663</sup> Information provided by UNICEF Serbia Country Office.

<sup>664</sup> UNICEF Europe and Central Asia Region COVID-19 response in education questionnaire, March 2021.

The Office for Information Technologies and eGovernment of Serbia also launched a portal called *Digitalna solidarnost* ("Digital Solidarity"),<sup>665</sup> where it publishes all information about free platforms for distance learning, working from home, and free online books, courses, movies, music and television content during the COVID-19 pandemic in a single place.<sup>666</sup> The Government also called upon all companies and other organizations in a position to do so to offer free-of-charge use of their digital platforms, content and solutions to citizens, businesses and countries. UNDP helped the Government of Serbia to consolidate more than 90 tools and services on this platform, including options for educational and cultural materials.<sup>667</sup>

In addition, with support from UNICEF and the EU, the Ministry of Education has launched the *Moja škola* e-learning management system,<sup>668</sup> which is open-source software widely used in Serbia to access lessons hosted on the state broadcaster's video-on-demand service.<sup>669</sup> Schools have also been instructed to come up with their own ways of conducting distance learning using collaboration software, and a number of textbook publishers have offered free digital versions to students in the country.<sup>670</sup> Additionally, the Serbian Government received support from UNICEF to purchase the Camtasia software for recording distance learning classes in schools, procuring some 79 software licences.<sup>671</sup>

Government responses also supported the use of other digital tools through public-private partnerships. For example, Microsoft and their local partner Informatika prepared instructions for teachers on the use of its Office 365 platform.<sup>672</sup> The video-conference platform Zoom began to be offered in schools across Serbia, with free Internet access provided by the MTS Telecom and Telenor mobile networks. Additionally, the Ministry of Education, Science and Technological Development also formalized cooperation with the Viber app.<sup>673</sup> Local press reported that students were following classes on television through many online platforms, such as Google Classroom.<sup>674</sup>

It was also announced that a local hardware company, Comtrade, had donated the platform "My classroom TeslaEDU" for online teaching and testing of students in their final year of primary school. This platform was free for teachers and students during the crisis. Furthermore, students enrolled in the eighth and final year of primary school, who did not have access to online classes, received Internet access and devices (mobile phones and tablets) from Huawei (100 tablets), Comtrade (300 mobile phones), Telecom (800 Internet cards and 800 mobile phones), VIP (800 Internet cards and 400 mobile phones) and Telenor (which donated the same number as VIP).<sup>675</sup>

From pre-school to primary, secondary, higher and adult education, the EU's ongoing assistance for education in Serbia totals EUR 35 million, which has helped the country to acquire equipment

<sup>665</sup> [www.digitalnasolidarnost.gov.rs/#digitalnasolidarnost](http://www.digitalnasolidarnost.gov.rs/#digitalnasolidarnost).

<sup>666</sup> [www.srbija.gov.rs/vest/en/151680/free-digital-content-on-new-digital-solidarity-portal.php](http://www.srbija.gov.rs/vest/en/151680/free-digital-content-on-new-digital-solidarity-portal.php).

<sup>667</sup> [www.undp.org/content/undp/en/home/blog/2020/how-covid-19-fosters-support-and-solidarity.html](http://www.undp.org/content/undp/en/home/blog/2020/how-covid-19-fosters-support-and-solidarity.html).

<sup>668</sup> [www.rasporednastave.gov.rs/](http://www.rasporednastave.gov.rs/).

<sup>669</sup> <https://emerging-europe.com/news/education-and-culture-in-cee-move-online-as-schools-close-and-public-gatherings-stop/>.

<sup>670</sup> <https://emerging-europe.com/news/education-and-culture-in-cee-move-online-as-schools-close-and-public-gatherings-stop/>.

<sup>671</sup> [www.unicef.org/serbia/en/coronavirus-covid-19](http://www.unicef.org/serbia/en/coronavirus-covid-19).

<sup>672</sup> <https://rasporednastave.gov.rs/alati-uputstva.php>.

<sup>673</sup> <https://china-cee.eu/2020/06/04/serbia-social-briefing-serbian-society-and-education-system-response-to-covid-19/>.

<sup>674</sup> <http://globalcomment.com/covid-19-and-the-serbian-school-system-the-impact-on-childrens-mental-health/>.

<sup>675</sup> [https://china-cee.eu/wp-content/uploads/2020/06/2020s05\\_Serbia.pdf](https://china-cee.eu/wp-content/uploads/2020/06/2020s05_Serbia.pdf).



for the preparation and delivery of teaching, but also for teacher training,<sup>676</sup> infrastructure improvement and curriculum modernization.<sup>677</sup> EU assistance in IT-related tools in the country is worth EUR 3.2 million alone.<sup>678</sup> In the context of COVID-19, EU funding has also supported distance and online education in Serbia. One example is the SELFIE tool. Designed by the European Commission to “help schools embed digital technologies into teaching, learning and assessment” by surveying students, teachers and administrators on the use of technology in their schools, the tool generates a status snapshot of an institution’s strengths and weaknesses in using digital tools. It thereby supports schools in assessing readiness to integrate technologies into the learning process, while simultaneously enhancing the digital skills of both teachers and students. Serbia has participated in all pilots of the SELFIE tool since 2017, and the tool has also proven useful for assessing the digital maturity of schools.<sup>679</sup>

UNICEF and the Government of Serbia, with support from the EU, are also addressing questions about the prevailing digital divide in the country and how it affects learning outcomes across different communities and geographical regions.<sup>680</sup> For example, UNICEF has already supported national education authorities to provide distance learning, helping more than 790 000 children.<sup>681</sup> In particular, the Ministry of Education, Science and Technological Development has engaged with UNICEF to develop a national response plan for the pre-school education system to the COVID-19 pandemic, with a focus on pre-school children and their families. Additionally, the Government has expressed interest in UNICEF’s RapidPro platform, an open-source platform of applications that can help governments deliver rapid and vital real-time information and connect communities to life-saving services.

With regard to teacher training in ICTs, government support to teachers has included online training seminars,<sup>682</sup> and UNICEF has assisted the Ministry of Education, Science and Technological Development in supporting teachers to develop interactive materials for the national online learning platform and prepare television lessons by procuring Camtasia and video-editing software. UNICEF is working with the Institute for the Improvement of Education to strengthen national training in both the new curriculum and teachers’ digital competencies and with the Institute for Education Quality and Evaluation, which has provided training on formative assessment, including in distance learning, to approximately 4 500 teachers.<sup>683</sup> Together, UNICEF and the Institute for the Improvement of Education have established a digital support service for planning and implementing distance instruction and, more generally, digital learning. This newly instated web portal<sup>684</sup> aims to help teachers in preparing materials for distance and digital learning and also contains materials for psychologists and education experts, who comprise a growing community of professionals who also organize regular webinars and thematic meetings at the national level. The portal is operating as part of a partnership between the Ministry of Education, Science and Technological Development, UNICEF and the Pedagogic Society of

<sup>676</sup> [www.wb6cif.eu/wp-content/uploads/2020/05/Strategic-Response-to-Covid-19-in-SEE.pdf](http://www.wb6cif.eu/wp-content/uploads/2020/05/Strategic-Response-to-Covid-19-in-SEE.pdf).

<sup>677</sup> <http://europa.rs/eu-support-to-distance-and-online-education-in-serbia/?lang=en>.

<sup>678</sup> <http://europa.rs/eu-support-to-distance-and-online-education-in-serbia/?lang=en>.

<sup>679</sup> [https://ec.europa.eu/education/schools-go-digital/selfie\\_news/selfie-in-the-western-balkans\\_en](https://ec.europa.eu/education/schools-go-digital/selfie_news/selfie-in-the-western-balkans_en); information provided by UNICEF Serbia Country Office.

<sup>680</sup> [www.unicef.org/serbia/media/15111/file/UNICEF's%20response%20to%20the%20COVID-19%20pandemic%20in%20Serbia.pdf](http://www.unicef.org/serbia/media/15111/file/UNICEF's%20response%20to%20the%20COVID-19%20pandemic%20in%20Serbia.pdf).

<sup>681</sup> [www.unicef.org/serbia/en/coronavirus-covid-19](http://www.unicef.org/serbia/en/coronavirus-covid-19).

<sup>682</sup> <http://tcg.uis.unesco.org/survey-education-covid-school-closures/>.

<sup>683</sup> UNICEF Europe and Central Asia Region COVID-19 response in education questionnaire, September 2021.

<sup>684</sup> [www.portal.edu.rs/podrska/](http://www.portal.edu.rs/podrska/).

Serbia.<sup>685</sup> By the end of 2020, more than 41 500 teachers had been trained, with UNICEF's support, to implement distance teaching.<sup>686</sup> In addition, in order to increase the education system's readiness for a smooth transition among learning modalities so as to better respond to emergencies, UNICEF is working with the Ministry of Trade, Tourism and Telecommunications to map school geolocations and school connectivity.

## 3.8 Turkey

### 3.8.1 Overview of the education system and status of broadband

Article 42 of the Constitution of the Republic of Turkey states that no one shall be deprived of the right to education, which is free of charge for compulsory education.<sup>687</sup> Founded in 1924, the modern Turkish education system established new secular schools based on contemporary scientific and educational principles, under the supervision and control of the State.<sup>688</sup> With the implementation of reforms and the development of the country in past decades, education has become central to Turkey's emergence as a unified republic.<sup>689</sup> In 2012, Turkey increased the duration of compulsory schooling from 8 to 12 years, with the aim of expanding participation in upper secondary education. The school starting age was set at six years old in 2019. The system in Turkey includes optional pre-primary (*Okul Öncesi*) education for children from ages three to six years, as well as compulsory primary education (*İlköğretim*) for all children from ages 5.5/7 to 14/15.<sup>690</sup> The first phase of compulsory education lasts eight years (1<sup>st</sup> to 8<sup>th</sup> grade) and is free at public schools. Secondary education (*Lise*) is for students from ages 14/15 to 18/19 and lasts four years (9<sup>th</sup> to 12<sup>th</sup> grade). It includes general, vocational and technical high schools.<sup>691</sup> This model is known as the "4+4+4 model".<sup>692</sup>

In terms of organization, Turkey has a highly centralized governance structure, in which education policy is steered by the Ministry of National Education and, at the tertiary level, by the Council of Higher Education. There are about 57 000 public and private schools in the country employing over 1.1 million teachers and enrolling more than 18 million pupils (2019-2020),<sup>693</sup> making Turkey the largest school system in Europe by far.<sup>694</sup> Given the magnitude of the system operating in a centralized manner, schools also face challenges in determining curriculum and assessment policies. As noted by the OECD, among European countries, only in Greece and Luxembourg is a similar degree of decision-making authority concentrated with central government, and their school systems are markedly smaller than Turkey's.<sup>695</sup> As a result, coordination across

<sup>685</sup> [www.unicef.org/serbia/media/15111/file/UNICEF's%20response%20to%20the%20COVID-19%20pandemic%20in%20Serbia.pdf](http://www.unicef.org/serbia/media/15111/file/UNICEF's%20response%20to%20the%20COVID-19%20pandemic%20in%20Serbia.pdf).

<sup>686</sup> UNICEF Humanitarian Action for Children regional indicator reporting; additional information provided by UNICEF Serbia Country Office.

<sup>687</sup> [www.refworld.org/docid/3ae6b5be0.html](http://www.refworld.org/docid/3ae6b5be0.html).

<sup>688</sup> <https://education.stateuniversity.com/pages/1562/Turkey-EDUCATIONAL-SYSTEM-OVERVIEW.html>.

<sup>689</sup> [www.oecd-ilibrary.org/sites/71ee93b4-en/index.html?itemId=/content/component/71ee93b4-en](http://www.oecd-ilibrary.org/sites/71ee93b4-en/index.html?itemId=/content/component/71ee93b4-en).

<sup>690</sup> Turkey has an existing policy on early childhood education and the Government is working towards making such education compulsory, with a commitment to expanding access to at least one year of pre-primary education to all five-year-olds ([https://2023vizyonu.meb.gov.tr/doc/2023\\_VIZYON\\_ENG.pdf](https://2023vizyonu.meb.gov.tr/doc/2023_VIZYON_ENG.pdf)).

<sup>691</sup> [www.angloinfo.com/how-to/turkey/family/schooling-education/school-system#:~:text=The%20school%20system%20in%20Turkey,age%20three%20to%20six%20years&text=Secondary%20\(Lise\)%3A%20Schooling%20for,vocational%20and%20technical%20high%20schools](http://www.angloinfo.com/how-to/turkey/family/schooling-education/school-system#:~:text=The%20school%20system%20in%20Turkey,age%20three%20to%20six%20years&text=Secondary%20(Lise)%3A%20Schooling%20for,vocational%20and%20technical%20high%20schools).

<sup>692</sup> [www.tandfonline.com/doi/full/10.1080/03050068.2015.1087211](http://www.tandfonline.com/doi/full/10.1080/03050068.2015.1087211).

<sup>693</sup> [http://sgb.meb.gov.tr/meb\\_iys\\_dosyalar/2020\\_09/04144812\\_meb\\_istatistikleri\\_orgun\\_egitim\\_2019\\_2020.pdf](http://sgb.meb.gov.tr/meb_iys_dosyalar/2020_09/04144812_meb_istatistikleri_orgun_egitim_2019_2020.pdf).

<sup>694</sup> [www.oecd-ilibrary.org/sites/71ee93b4-en/index.html?itemId=/content/component/71ee93b4-en](http://www.oecd-ilibrary.org/sites/71ee93b4-en/index.html?itemId=/content/component/71ee93b4-en).

<sup>695</sup> [www.oecd-ilibrary.org/sites/71ee93b4-en/index.html?itemId=/content/component/71ee93b4-en](http://www.oecd-ilibrary.org/sites/71ee93b4-en/index.html?itemId=/content/component/71ee93b4-en).

directorates throughout the country is challenging.<sup>696</sup> The country has signalled its intention to decentralize education governance, but the delegation of responsibilities to local governments or schools is yet to be accomplished.<sup>697</sup>

Although nearly all public funding for education in Turkey comes from central government, it is often the case that schools have little autonomy and capacity to address their local needs. This means that it falls within the purview of the Ministry of National Education to determine the allocation of human and financial resources to schools via its provincial directorates.<sup>698</sup> To meet the demands of a fast-growing education system, overall expenditure on education in Turkey has increased substantially in recent years. The most recent data show that public expenditure on education was 5.8 per cent of GDP in 2018 and 5.7 per cent in 2017<sup>699</sup>, while the EU average for 2017 was 4.7 per cent.<sup>700</sup> The level of education which witnessed the steepest increase from 2018 to 2019 (in terms of education expenditure by funding source) was primary school education, at 30.1 per cent. This was followed by lower secondary education, at 25.1 per cent.<sup>701</sup> Turkey is also known for having one of the highest shares of educational spending from private sources, including international sources, relative to OECD countries. Despite increases in overall spending, Turkey's per-student spending is around half the OECD average for primary and secondary education and around two-thirds for early childhood education and care and tertiary education.<sup>702</sup>

In recent years, government-led efforts aimed at enhancing access to education, improving the quality of education and training, and revamping the institutional capacity of the education system have been the focus of the country's strategies. As a result, Turkey has become one of the few countries that have managed to improve student achievement while increasing access to education.<sup>703</sup> Over the years, there has been a positive increase in the net enrolment of students, particularly in pre-school education, which increased from 58.8 per cent in 2017 to 71.2 per cent in 2020. Moreover, the net enrolment rates in primary school increased from 91.2 per cent in 2017 to 93.6 per cent in 2020, yet remained almost static in lower secondary school, increasing only from 95.7 per cent to 95.9 per cent over the same period. In lower secondary education, the net enrolment rate increased from 82.5 per cent in 2017 to 85.0 per cent in 2020.<sup>704</sup> The completion rate for children of primary-school age was 98.4 per cent in 2014.<sup>705</sup> However, the completion rate for young people of upper-secondary age was 47.5 per cent in 2013.<sup>706</sup> Statistics from the Ministry of National Education differ slightly, with the primary school net schooling rate increasing from 91.9 per cent (2018-2019) to 93.6 per cent (2019-2020) and the upper secondary school net schooling rate increasing from 93.3 per cent to 95.9 per cent over the same period.<sup>707</sup> These patterns, as across the region, are reflected in out-of-school totals and rates as well. According to UNESCO numbers, there were 266 561 children of primary age (representing 5 per cent of the primary school-age population) and approximately 1.26 million

<sup>696</sup> [www.insightturkey.com/article/turkeys-education-policy-during-the-ak-party-era-2002-2013](http://www.insightturkey.com/article/turkeys-education-policy-during-the-ak-party-era-2002-2013).

<sup>697</sup> <https://spire.sciencespo.fr/hdl:/2441/9dtkp1jt69r3asqnojuqm8qlt/resources/07-va-focales.pdf>.

<sup>698</sup> [www.oecd-ilibrary.org/sites/71ee93b4-en/index.html?itemId=/content/component/71ee93b4-en](http://www.oecd-ilibrary.org/sites/71ee93b4-en/index.html?itemId=/content/component/71ee93b4-en).

<sup>699</sup> <https://data.tuik.gov.tr/Bulten/Index?p=Education-Expenditure-Statistics-2018-30588>.

<sup>700</sup> <https://data.worldbank.org/indicator/SE.XPD.SECO.PC.ZS?locations=EU>.

<sup>701</sup> <https://data.tuik.gov.tr/Bulten/Index?p=Education-Expenditure-Statistics-2019-33670>.

<sup>702</sup> [www.oecd.org/education/policy-outlook/country-profile-Turkey-2020.pdf](http://www.oecd.org/education/policy-outlook/country-profile-Turkey-2020.pdf).

<sup>703</sup> [www.oecd-ilibrary.org/sites/71ee93b4-en/index.html?itemId=/content/component/71ee93b4-en](http://www.oecd-ilibrary.org/sites/71ee93b4-en/index.html?itemId=/content/component/71ee93b4-en).

<sup>704</sup> <https://ec.europa.eu/neighbourhood-enlargement/sites/near/files/20190529-turkey-report.pdf>.

<sup>705</sup> [https://data.unicef.org/resources/data\\_explorer/unicef\\_f?ag=UNICEF&df=GLOBAL\\_DATAFLOW&ver=1.0&dq=MKD.ED\\_CR\\_L1+ED\\_CR\\_L3+ED\\_ANAR\\_L3+ED\\_15-24\\_LR.&startPeriod=2011&endPeriod=2020](https://data.unicef.org/resources/data_explorer/unicef_f?ag=UNICEF&df=GLOBAL_DATAFLOW&ver=1.0&dq=MKD.ED_CR_L1+ED_CR_L3+ED_ANAR_L3+ED_15-24_LR.&startPeriod=2011&endPeriod=2020).

<sup>706</sup> [https://data.unicef.org/resources/data\\_explorer/unicef\\_f?ag=UNICEF&df=GLOBAL\\_DATAFLOW&ver=1.0&dq=GEO.ED\\_CR\\_L1+ED\\_CR\\_L3+ED\\_ANAR\\_L3+ED\\_15-24\\_LR.T&startPeriod=2014&endPeriod=2020](https://data.unicef.org/resources/data_explorer/unicef_f?ag=UNICEF&df=GLOBAL_DATAFLOW&ver=1.0&dq=GEO.ED_CR_L1+ED_CR_L3+ED_ANAR_L3+ED_15-24_LR.T&startPeriod=2014&endPeriod=2020).

<sup>707</sup> Data provided by the Information and Communication Technologies Authority (BTK).

adolescents (representing 6.2 per cent and 17 per cent of the lower- and upper-secondary-age populations, respectively) out of school in 2018 alone.<sup>708</sup>

The Government has also responded to the large-scale influx of refugees since the onset of the Syrian conflict nearly 10 years ago. In 2020, the number of Syrians registered under temporary protection remained stable at more than 3.6 million, including 1.6 million children. In 2020, out of the overall total of 1.6 million Syrian refugee children, nearly 75 per cent, or around 1.2 million children, were of school age (between ages 5 and 17). As of September 2020, all temporary education centres were closed, and all children were mainstreamed into Turkish public schools for the 2020-2021 academic year. As at March 2021, 774 257 Syrian refugee children were enrolled in Turkish public schools, representing an overall increase of 13 per cent compared to the previous school year (2019-2020). The gross enrolment rate reached 64.7 per cent in March 2021, a 1.4-per-cent increase from the previous academic year. However, gross enrolment rates in pre-primary and upper secondary education continue to be very low, at 27.3 per cent and 40.1 per cent, respectively. Despite significant overall achievements resulting from support from various education sector partners, more than 400 000 children remain out of school, corresponding to approximately 35.3 per cent of the Syrian school-age population.<sup>709</sup> Various studies have been carried out by the Ministry of National Education in order to increase access to education for immigrant students. These studies, as well as projects implemented to fill learning gaps, are outlined in the sections below.

UNESCO data show that the literacy rate for the 15-24 years age group in Turkey was 99.8 per cent in 2017.<sup>710</sup> Importantly, among the nine countries included in this study, Turkey has the lowest rates of students who do not achieve minimum proficiency. Notably, however, this figure still means that 37.1 per cent of students are not achieving minimum proficiency,<sup>711</sup> which limits their further opportunities for learning and skills development and the impact of the country's efforts to reform the education system on learning outcomes.

Concerning broadband development, data from the Turkish Statistical Institute (TURKSTAT) for the first quarter of 2020 show that 79.0 per cent of individuals in Turkey used the Internet, which is higher than the official ITU figure of 77 per cent.<sup>712</sup> In 2020, the number of fixed-broadband subscriptions per 100 inhabitants was 19.8 according to ITU,<sup>713</sup> while TURKSTAT reports 20.0.<sup>714</sup> TURKSTAT data that feed into ITU's statistics show that 90.7 per cent of households in Turkey had Internet access at home, either via fixed, mobile or other services, in 2020.<sup>715</sup> While 50.8 per cent of households used a fixed-broadband connection (ADSL, cable, optical fibre, etc.), as reported by TURKSTAT,<sup>716</sup> ITU data indicate that 98.6 per cent of households relied on mobile-broadband connections to access the Internet. The figure stood at 86.9 per cent in 2020, according to

<sup>708</sup> <http://uis.unesco.org/en/country/tr>.

<sup>709</sup> Information provided by UNICEF Turkey Country Office.

<sup>710</sup> <http://uis.unesco.org/en/country/tr>.

<sup>711</sup> UNICEF calculation of the number of students in primary, lower secondary and upper secondary not achieving minimum proficiency in mathematics; data for Turkey are based on the latest available figures from UIS and OECD PISA data.

<sup>712</sup> ITU World Telecommunication/ICT Indicators Database online (2021), available at <http://handle.itu.int/11.1002/pub/81550f97-en> (indicator i99H).

<sup>713</sup> ITU World Telecommunication/ICT Indicators Database online (2021), available at <http://handle.itu.int/11.1002/pub/81550f97-en> (indicator i992b).

<sup>714</sup> BTK market data report on Turkish electronic communication sector for 2020 Q4 ([www.btk.gov.tr/pazar-verileri](http://www.btk.gov.tr/pazar-verileri)); information provided by BTK.

<sup>715</sup> [www.itu.int/en/ITU-D/Statistics/Documents/statistics/2019/CoreHouseholdIndicators.xlsx](http://www.itu.int/en/ITU-D/Statistics/Documents/statistics/2019/CoreHouseholdIndicators.xlsx).

<sup>716</sup> [www.turkstat.gov.tr/PreHaberBultenleri.do?id=30574](http://www.turkstat.gov.tr/PreHaberBultenleri.do?id=30574).

TURKSTAT.<sup>717</sup> Over the years, fixed-broadband usage has increased considerably, with about 4 million subscriptions relying on fibre-optic technology (FTTH/FTTB) by the end of 2020.<sup>718</sup> In 2020, 92.5 per cent of enterprises used a fixed-broadband connection to access the Internet.<sup>719</sup>

Data from the Information and Communication Technologies Authority (BTK) show that Türk Telekom has the widest fibre infrastructure in the country, with a 331 041 km network, while other operators' optical fibre length was 93 874 km in 2020.<sup>720</sup> Compared to the OECD average for fixed-broadband penetration of 31.4 per cent, Turkey has significant growth potential with its 20-per-cent penetration rate.<sup>721</sup>

According to the latest BTK data, by the end of 2020 the number of active mobile-cellular subscriptions per 100 inhabitants was 98.2,<sup>722</sup> while the official ITU figure for 2020 was 97.4 per cent (small nuances can be explained by slightly different methodologies).<sup>723</sup> Moreover, according to ITU statistics, mobile-broadband subscriptions per 100 inhabitants amounted to 77.8 in 2020,<sup>724</sup> growing to 78.5 by the end of 2020, according to BTK's Market Data Report.<sup>725</sup> The country's 4G/LTE networks are well developed and cover about 98 per cent of the population;<sup>726</sup> the official ITU figure for 2019 stood at 96.7 per cent.<sup>727</sup> In 2019, mobile-broadband Internet traffic within the country was 4.1 EB,<sup>728</sup> and by the end of 2020 it amounted to 6.4 EB.<sup>729</sup> At the same point, BTK data also show that the average monthly mobile data usage per active LTE Advanced subscription in Turkey was 11.6 GB. In terms of broadband mapping, no information has been made publicly available for Turkey, although BTK is working to make both fixed- and mobile-broadband maps available to the public, with publication expected through the e-Government gateway in 2021.<sup>730</sup>

<sup>717</sup> TURKSTAT Information and Communication Technology (ICT) Usage Survey on Households and Individuals, 2020 ([https://data.tuik.gov.tr/Bulten/Index?p=Survey-on-Information-and-Communication-Technology-\(ICT\)-Usage-in-Enterprises-2021-37435&dil=2](https://data.tuik.gov.tr/Bulten/Index?p=Survey-on-Information-and-Communication-Technology-(ICT)-Usage-in-Enterprises-2021-37435&dil=2)).

<sup>718</sup> BTK market data report on Turkish electronic communication sector for 2020 Q4 ([www.btk.gov.tr/pazar-verileri](http://www.btk.gov.tr/pazar-verileri)); information provided by BTK.

<sup>719</sup> TURKSTAT survey on use of ICT by enterprises, 2020 (<https://data.tuik.gov.tr/Bulten/Index?p=Girisimlerde-Bilisim-Teknolojileri-Kullanım-Arastirmasi-2020-33677#:~:text=%C4%B0nternet%20eri%C5%9Fimine%20sahip%20giri%C5%9Fimlerin%20oran%C4%B1,y%C4%B1l%C4%B1nda%20%94%2C9%20oldu>).

<sup>720</sup> BTK market data report on Turkish electronic communication sector for 2020 Q4 ([www.btk.gov.tr/pazar-verileri](http://www.btk.gov.tr/pazar-verileri)); information provided BTK.

<sup>721</sup> BTK market data report on Turkish electronic communication sector for 2020 Q4 ([www.btk.gov.tr/pazar-verileri](http://www.btk.gov.tr/pazar-verileri)); information provided by BTK.

<sup>722</sup> BTK market data report on Turkish electronic communication sector for 2020 Q4 ([www.btk.gov.tr/pazar-verileri](http://www.btk.gov.tr/pazar-verileri)); information provided by BTK.

<sup>723</sup> ITU World Telecommunication/ICT Indicators Database online (2021), available at <http://handle.itu.int/11.1002/pub/81550f97-en> (indicator i911).

<sup>724</sup> ITU World Telecommunication/ICT Indicators Database online (2021), available at <http://handle.itu.int/11.1002/pub/81550f97-en> (indicator i911mw).

<sup>725</sup> BTK market data report on Turkish electronic communication sector for 2020 Q4 ([www.btk.gov.tr/pazar-verileri](http://www.btk.gov.tr/pazar-verileri)); information provided by BTK.

<sup>726</sup> Data submitted to BTK by cellular mobile network operators, which will be incorporated into the ITU World Telecommunication/ICT Indicators Database online (<http://handle.itu.int/11.1002/pub/81550f97-en>).

<sup>727</sup> ITU World Telecommunication/ICT Indicators Database online (2020), available at <http://handle.itu.int/11.1002/pub/81550f97-en> (indicator i271GA).

<sup>728</sup> ITU World Telecommunication/ICT Indicators Database online (2020), available at <http://handle.itu.int/11.1002/pub/81550f97-en> (indicator i136mwi).

<sup>729</sup> BTK market data report on Turkish electronic communication sector for 2020 Q4 (<https://www.btk.gov.tr/pazar-verileri>); information provided by BTK.

<sup>730</sup> [www.itu.int/en/ITU-D/Regional-Presence/Europe/Documents/Events/2020/RRF/20-11-26%20Background%20Paper\\_Broadband%20Mapping%20Systems%20in%20Europe%20and%20Regional%20Harmonization%20Initiatives\\_final.pdf](http://www.itu.int/en/ITU-D/Regional-Presence/Europe/Documents/Events/2020/RRF/20-11-26%20Background%20Paper_Broadband%20Mapping%20Systems%20in%20Europe%20and%20Regional%20Harmonization%20Initiatives_final.pdf).

### 3.8.2 Government strategies, status of education quality, and the role of ICTs

Since 2010, the Government has developed five-year strategic plans with the objective of setting out clear targets for medium-term goals to inform work at the central, provincial and district levels. In 2018, the Ministry of National Education launched its Education Vision 2023,<sup>731</sup> aiming to reform the education system starting from the four central elements of the document: students, parents, teachers and schools. Building upon the Ministry's previous Strategic Plan for 2015-2019,<sup>732</sup> the new Education Vision 2023 promotes a holistic, human-centred approach to education. There are eight specific targets:<sup>733</sup>

- Reduce gaps between schools;
- Improve school learning environments;
- Improve the attractiveness of vocational education and training;
- Reduce exam pressure;
- Develop 21<sup>st</sup>-century skills;
- Improve educators' job satisfaction;
- Expand early childhood education and care; and
- Improve inclusive practices for students with special educational needs.

The Vision establishes 44 subgoals based on equity, inclusiveness, quality and effectiveness in teaching. It also is aligned with other recommendations from the OECD in terms of student agency, school governance and evidence-based decision-making.<sup>734</sup> Each of the main goals has a policy timeline, often including piloting phases. While the goals set out solutions to well-identified problems, the document does not present details of methods or action plans for each of the 44 subgoals. The Education Vision 2023's School Development Model aims for more equal and inclusive allocation of funding, taking into account differences among students, schools and geographical locations throughout the country.<sup>735</sup>

Within the framework of the Education Vision 2023, is the Ministry of National Education aims to expand early childhood education services and increase access to early childhood education. In this context, the "Early Childhood Education for Syrian Children in Turkey and Vulnerable Turkish Children" project is being implemented. The project aims to improve the conditions that support early childhood development for Syrian children aged three to six and disadvantaged children in the host community. In order to enable Syrian students to benefit from the educational opportunities offered and participate in the employment market in the future, efforts are also being made to guide them towards vocational education.<sup>736</sup>

<sup>731</sup> [https://2023vizyonu.meb.gov.tr/doc/2023\\_VIZYON\\_ENG.pdf](https://2023vizyonu.meb.gov.tr/doc/2023_VIZYON_ENG.pdf).

<sup>732</sup> [www.eun.org/documents/411753/839549/Country+Report+Turkey+2017.pdf/054bdb93-3978-42bf-8040-ee590f9efe13](http://www.eun.org/documents/411753/839549/Country+Report+Turkey+2017.pdf/054bdb93-3978-42bf-8040-ee590f9efe13).

<sup>733</sup> [https://2023vizyonu.meb.gov.tr/doc/2023\\_VIZYON\\_ENG.pdf](https://2023vizyonu.meb.gov.tr/doc/2023_VIZYON_ENG.pdf).

<sup>734</sup> [www.oecd.org/turkey/turkeys-2023-education-vision-is-paradigm-shift-possible-france-march-2019.htm](http://www.oecd.org/turkey/turkeys-2023-education-vision-is-paradigm-shift-possible-france-march-2019.htm).

<sup>735</sup> [www.oecd.org/education/policy-outlook/country-profile-Turkey-2020.pdf](http://www.oecd.org/education/policy-outlook/country-profile-Turkey-2020.pdf).

<sup>736</sup> Information provided by BTK.

According to 2018 PISA results,<sup>737</sup> Turkey's student scores for reading, mathematics and science were lower than the OECD average.<sup>738</sup> Mathematics scores increased by 4.1 points and science by 6.1 in 2018;<sup>739</sup> however, in comparison to results from 2009 and 2012, the 2018 results show that, in all three subjects, the country's mean performance was not significantly different, though higher than the levels observed in 2003 and 2006. If taken into account, the 2015 results—which were considerably lower—were anomalous, and neither the decline between 2012 and 2015 nor the recovery between 2015 and 2018 reflects the long-term trajectory. Overall, the educational outcome trajectory is positive in both mathematics (over the 2003-2018 period) and science (2006-2018). In mathematics, improvements were more pronounced at the bottom of the performance distribution, amongst the lowest-achieving students, who caught up with higher-performing students. About 27 per cent of these students were enrolled in disadvantaged schools.<sup>740</sup>

Another trend identified by the OECD shows that these numbers might reflect a period of rapid expansion of secondary education in Turkey and the fact that educational attainment has been positive in the country.<sup>741</sup> For instance, between 2003 and 2018, Turkey added more than 400 000 students to the total population of 15-year-olds eligible to participate in PISA; consequently, the proportion of 15-year-olds covered by PISA samples more than doubled, from about 36 per cent in 2003 to 73 per cent in 2018. This expansion in education opportunities likely dampened a more positive underlying trend in student performance. Indeed, a simulation that assumes that the top-scoring 25 per cent of 15-year-olds were eligible to take the test in any given year shows a positive trend among this population in mathematics (since 2003) and science (since 2006). Furthermore, Turkey's growth in the share of young adults with an upper secondary qualification was the second largest among OECD countries between 2008 and 2018. At tertiary level, it was the largest.<sup>742</sup>

A 2019 evaluation by the European Commission states that quality and inclusiveness are among the main priorities in reducing disparities between urban and rural areas. It reiterates the importance for the country of enhancing the quality of teachers through continuous professional development and in-service training, reducing gender inequalities, updating curricula to include transferable skills, and so on.<sup>743</sup> In the context of inclusion, UNICEF reports that different groups of vulnerable children face different challenges in Turkey, with refugee children particularly at risk of not accessing any form of education. It highlights the fact that, in 2016, only about 320 000 refugee children were enrolled in school (approximately 36 per cent of the school-age refugee population), posing a significant challenge for the education sector to accommodate an

<sup>737</sup> PISA tests the reading, mathematics and science performance of 15-year-old pupils across the world every three years. In the context of the European Union, PISA results are particularly important because they feed into the Education and Training 2020 strategic cooperation framework (ET2020). They form the basis for one of the ET2020 benchmarks: the rate of underachievers in reading, mathematics or science among 15-year-olds in the EU should be less than 15 per cent by 2020. Underachievers in PISA are those pupils who fail to reach the minimum proficiency level necessary to participate successfully in society. More information on the PISA indicators and ET2020 is available at [https://ec.europa.eu/education/sites/education/files/document\\_library-docs/pisa-2018-eu\\_1.pdf](https://ec.europa.eu/education/sites/education/files/document_library-docs/pisa-2018-eu_1.pdf).

<sup>738</sup> [www.oecd.org/pisa/publications/PISA2018\\_CN\\_TUR.pdf](http://www.oecd.org/pisa/publications/PISA2018_CN_TUR.pdf).

<sup>739</sup> [www.oecd.org/education/policy-outlook/country-profile-Turkey-2020.pdf](http://www.oecd.org/education/policy-outlook/country-profile-Turkey-2020.pdf).

<sup>740</sup> [www.oecd.org/pisa/publications/PISA2018\\_CN\\_TUR.pdf](http://www.oecd.org/pisa/publications/PISA2018_CN_TUR.pdf).

<sup>741</sup> <https://openknowledge.worldbank.org/bitstream/handle/10986/27852/754470NWP0Box30pportunityOEducaton.pdf?sequence=1&isAllowed=y>.

<sup>742</sup> [www.oecd.org/education/policy-outlook/country-profile-Turkey-2020.pdf](http://www.oecd.org/education/policy-outlook/country-profile-Turkey-2020.pdf).

<sup>743</sup> <https://ec.europa.eu/neighbourhood-enlargement/sites/near/files/20190529-turkey-report.pdf>.

unprecedented number of additional children in school.<sup>744</sup> Other non-native Turkish speakers might also be at disadvantage.

In order to increase access to school for a greater number of children, various studies are being carried out, such as the Conditional Cash Transfer for Education programme for foreigners. In this context, families receive cash support every two months through Kızılaykart on the condition that the child has attended school regularly (at least 80 per cent) in the preceding school months. During the distance education period caused by the COVID-19 pandemic, students continued to receive cash transfers.<sup>745</sup>

Additionally, an accelerated learning programme has been introduced in order to give out-of-school children access to education. The programme is implemented in 75 public education centres in 12 provinces so as to integrate Syrian children who have been out of formal education (for three to six years) into the formal education system. During the COVID-19 pandemic, training packages were sent to support the education of students studying under the programme. A story set consisting of 14 books and a personal care package for 4 000 parents was sent to 4 000 students benefiting from the programme. In addition, study materials prepared by teachers working within the scope of the programme were sent to students through social media applications.<sup>746</sup>

According to statistics from the Ministry of National Education, the proportion of girls and boys in pre-school or elementary school is almost equal, with 93.7 per cent of boys and 93.5 per cent of girls enrolled in primary school, 95.7 per cent of boys and 96.1 per cent of girls enrolled in lower secondary school, and 85.2 per cent of boys and 84.9 per cent of girls enrolled in upper secondary school.<sup>747</sup> Secondary education in Turkey has also made notable strides towards gender equality, but some challenges remain vis-à-vis gender equality in education access. For example, Turkey is still behind other countries in the European region in terms of its gender parity index at all stages of education and the expected number of years of formal schooling for females from primary school to higher education.<sup>748, 749</sup> This is true in Bitlis, Muş and Şanlıurfa in the eastern region of Turkey, where gender disparities in education access remain at a significant level.<sup>750</sup> This observation is also relevant to the context of ICT access and distance learning. A recent study by the World Bank showed that girls may be more disadvantaged than boys in accessing home-based education in Turkey in the future, as they are expected to undertake more household chores, particularly in large and/or conservative families.<sup>751</sup>

The proposed curriculum-related changes articulated in Turkey's Education Vision 2023 make the case for more flexible learning linked to skills sets across all educational levels. This would allow for a curriculum tailored and organized according to the interests, skills and goals of students. As a result, the Government envisages a common, country-wide curriculum that emphasizes production, active learning, interaction and in-depth study of topics, instead of

<sup>744</sup> [www.unicef.org/turkey/media/6636/file/UNICEF%20TURKEY%20ANNUAL%20REPORT%202018.pdf](http://www.unicef.org/turkey/media/6636/file/UNICEF%20TURKEY%20ANNUAL%20REPORT%202018.pdf).

<sup>745</sup> Information provided by BTK.

<sup>746</sup> Information provided by BTK.

<sup>747</sup> [http://sgb.meb.gov.tr/meb\\_iys\\_dosyalar/2020\\_09/04144812\\_meb\\_istatistikleri\\_organ\\_egitim\\_2019\\_2020.pdf](http://sgb.meb.gov.tr/meb_iys_dosyalar/2020_09/04144812_meb_istatistikleri_organ_egitim_2019_2020.pdf).

<sup>748</sup> For more information please contact [www.unicef.org/](http://www.unicef.org/).

<sup>749</sup> [www.researchgate.net/publication/287268677\\_A\\_Comparison\\_of\\_Gender\\_Inequality\\_in\\_Turkish\\_Education\\_System\\_with\\_that\\_of\\_EU\\_Countries](http://www.researchgate.net/publication/287268677_A_Comparison_of_Gender_Inequality_in_Turkish_Education_System_with_that_of_EU_Countries).

<sup>750</sup> Information provided by the Ministry of National Education via BTK; see [http://sgb.meb.gov.tr/meb\\_iys\\_dosyalar/2020\\_09/04144812\\_meb\\_istatistikleri\\_organ\\_egitim\\_2019\\_2020.pdf](http://sgb.meb.gov.tr/meb_iys_dosyalar/2020_09/04144812_meb_istatistikleri_organ_egitim_2019_2020.pdf).

<sup>751</sup> <http://documents1.worldbank.org/curated/en/788991593396173808/pdf/Turkey-Safe-Schooling-and-Distance-Education-Project.pdf>.



traditional testing and lecturing. In this context, the plan includes the establishment of design workshops to facilitate such an approach towards the national curriculum, which had already begun as a pilot program during the 2019-2020 academic year with technical and financial support from UNICEF. Furthermore, the strategy also stipulates that in-classroom hours and types of compulsory lessons will decrease to make a more modular schedule possible.<sup>752</sup>

In terms of school mapping and data collection,<sup>753</sup> Turkey's Education Vision 2023 also sets critical goals for monitoring, evaluating and developing management and learning activities nationwide. The document sets the foundations by identifying that one of the most pressing needs of the Ministry of National Education is to implement system integration and design as a result of process and functional analyses. In particular, the strategy has four specific goals that are relevant for school mapping:<sup>754</sup>

- An online platform will be established through which the Ministry and school administrators can monitor school development plans at the district, provincial, regional and national levels;
- A geographical information system will be established to identify the capacities of schools in the planning of educational resources;
- A new platform will be developed on the data information system, which will ensure interaction among teachers, parents and schools;
- Students in need of support will be identified through data analysis, and necessary actions will be included in school-level development plans.

In this context, the Government has made available an e-school module supported by the Ministry's MEBBIS database, which can be accessed by all schools. School administrators, teachers, students and parents can feed data into the system annually through self-evaluation functions, which in return offer schools the data necessary to develop self-improvement plans. The tool aims to aid in school empowerment and is part of school decentralization plans.<sup>755</sup>

Furthermore, within the scope of Education Vision 2023, in 2019 the Turkish Government launched MEBCBS, a geographical information system operating under the Ministry of National Education, which includes data on schools as well as on facilities that are affiliated with the Ministry.<sup>756</sup> The Ministry has emphasized that MEBCBS information pertaining to schools is key to the success of activities related to planning, producing, monitoring and supervising schools, as well as developing modern, environmentally friendly and original infrastructure.<sup>757</sup> A list of all schools and their geographical data, filtered by provinces, is available on the Ministry's website.<sup>758</sup> For each school, it contains relevant information such as the number of classrooms, as along with numbers of teachers and students.

In terms of access to ICTs and broadband in the school environment, initiatives to reduce gaps have been taken by the Government, especially to expand the number of computers and computer classes in primary and secondary schools and provide increased access to the Internet through community use of school computers.<sup>759</sup> According to OECD data, there are

<sup>752</sup> [www.conexioconsulting.com/2023-turkey-education-vision-announced/](http://www.conexioconsulting.com/2023-turkey-education-vision-announced/).

<sup>753</sup> <https://mebbisyd.meb.gov.tr/>.

<sup>754</sup> [https://2023vizyonu.meb.gov.tr/doc/2023\\_VIZYON\\_ENG.pdf](https://2023vizyonu.meb.gov.tr/doc/2023_VIZYON_ENG.pdf).

<sup>755</sup> [www.oecd-ilibrary.org/sites/a85d5b7b-en/index.html?itemId=/content/component/a85d5b7b-en](http://www.oecd-ilibrary.org/sites/a85d5b7b-en/index.html?itemId=/content/component/a85d5b7b-en).

<sup>756</sup> [www.meb.gov.tr/meb-cbs-bir-bakista-konuma-dayali-tum-verilere-erisim/haber/19085/tr](http://www.meb.gov.tr/meb-cbs-bir-bakista-konuma-dayali-tum-verilere-erisim/haber/19085/tr).

<sup>757</sup> [www.aa.com.tr/tr/egitim/meb-turkiyenin-egitim-haritasini-cikardi/1544967](http://www.aa.com.tr/tr/egitim/meb-turkiyenin-egitim-haritasini-cikardi/1544967).

<sup>758</sup> [www.meb.gov.tr/baglantilar/mem/index\\_ilmem.php](http://www.meb.gov.tr/baglantilar/mem/index_ilmem.php).

<sup>759</sup> <http://documents1.worldbank.org/curated/en/873111468120293312/pdf/691700ESW0P12000BroadbandQinOTurkey.pdf>.

0.16 computers per student in the country, amounting to over 2.5 million PCs available in schools, though this is far from the OECD average of 0.77.<sup>760</sup>

Despite that, 2018 PISA results show that only 61 per cent of 15-year-old students in Turkey had access to both a computer and the Internet at home. There was also a wide gap in access across socio-economic strata. While 92 per cent of students in the richest quintile had access to a computer and the Internet at home, only 22 per cent of students in the poorest quintile did.<sup>761</sup> Similarly, according to data from the World Bank, in 2020 only 39 per cent of poor households with school-age children had access to the Internet, and this number became even lower when three or more children were present in the household. Additionally, only 14 per cent of poor households had access to computers, compared to 44 per cent of households on average.<sup>762</sup> Moreover, gaps in digital literacy in the educational context have been identified. In the International Computer and Information Literacy Study 2013, Turkey stood last among the 21 participating education systems, and 67 per cent of grade 8 students in Turkey did not have a functional working knowledge of computers (compared with an average of 17 per cent across the study as a whole).<sup>763</sup>

### 3.8.3 Multistakeholder partnerships and financing mechanisms fostering investment in school connectivity

Public-private partnerships between Intel and Turkish organizations have been in place to support ICTs and connectivity in the school context. They include, for example, the My First PC initiative, which occurred thanks to a partnership between Intel, Microsoft, Türk Telekom and the Ministry of National Education to provide 75 000 families with a technology package that included a low-cost computer with Microsoft software, free ADSL Internet connection, parental control software and after-sales support. Through another public-private partnership, approximately 220 000 PCs had been donated for school labs across Turkey by 2008, and the acquisition of laptops by teachers was facilitated across the country through economic subsidies and affordable instalment plans.<sup>764</sup>

In 2010, Turkey launched a project entitled “Movement to Enhance Opportunities and Improve Technology” (FATİH)<sup>765</sup> with the goal of extending and enhancing the use of ICTs in teaching practices and learning.<sup>766</sup> Initially, the project was a collaborative effort led by the Ministry of National Education with the support of several other ministries, such as the Treasury and the Scientific and Technological Research Council. Over time, FATİH became one of the leading

<sup>760</sup> [https://gpseducation.oecd.org/IndicatorExplorer?plotter=h5&query=34&indicators=N051\\*N055\\*N160\\*S016\\*S017\\*S018\\*N052\\*N056\\*N057\\*R001\\*R005\\*N037\\*N038\\*N039\\*N040\\*N041\\*N042\\*T012\\*T013\\*C076\\*P005\\*P006\\*N050\\*T037\\*A256\\*A258\\*A263\\*A264\\*A265\\*P819\\*N122\\*N123\\*N236\\*N237\\*N238\\*N239](https://gpseducation.oecd.org/IndicatorExplorer?plotter=h5&query=34&indicators=N051*N055*N160*S016*S017*S018*N052*N056*N057*R001*R005*N037*N038*N039*N040*N041*N042*T012*T013*C076*P005*P006*N050*T037*A256*A258*A263*A264*A265*P819*N122*N123*N236*N237*N238*N239).

<sup>761</sup> <http://documents1.worldbank.org/curated/en/788991593396173808/pdf/Turkey-Safe-Schooling-and-Distance-Education-Project.pdf>.

<sup>762</sup> <https://documents1.worldbank.org/curated/en/788991593396173808/pdf/Turkey-Safe-Schooling-and-Distance-Education-Project.pdf>.

<sup>763</sup> [www.iea.nl/studies/iea/icils/2013](http://www.iea.nl/studies/iea/icils/2013).

<sup>764</sup> [www.intel.com.br/content/dam/doc/case-study/learning-series-elearning-in-turkey-study.pdf](http://www.intel.com.br/content/dam/doc/case-study/learning-series-elearning-in-turkey-study.pdf).

<sup>765</sup> <http://fatihprojesi.meb.gov.tr/en/about.html>.

<sup>766</sup> <https://blogs.worldbank.org/edutech/observing-turkeys-ambitious-fatih-initiative-provide-all-students-tablets-and-connect-all-classrooms>.

projects seeking to foster digital skills and bridge the ICT gap found in Turkish schools. Actions included:

- Establishing the necessary infrastructure, including broadband Internet connections, tablets, interactive boards and online platforms;
- Developing and managing online educational content and resources;
- Promoting the effective application of ICT in teaching programmes;
- Offering professional development to teachers, including face-to-face and online training; and
- Ensuring the ethical, reliable, manageable and measurable use of ICT.

The project's expected results include connectivity and use of ICTs at the following levels: (i) for every school: VPN-broadband Internet access, infrastructure and high-speed access; (ii) for every classroom: interactive white board and wired/wireless Internet access; (iii) for every teacher: EBA<sup>767</sup> mobile applications and EBA, including sharing course notes, tracking student progress, communicating with students, accessing teaching and professional development content, benefiting from individual file storage, authoring learning content, teaching over the Internet using live classrooms, etc; (iv) for every student: EBA mobile applications and EBA, including sharing homework, accessing both guided and individual learning materials, communicating with peers and teachers, tracking progress, attending live classrooms over the Internet, etc.

The FATİH project was initially intended to run for five years, with phase 1 focused on high schools, phase 2 on vocational schools and phase 3 on primary schools and pre-school.<sup>768</sup> According to an assessment by the Research Triangle Institute from 2013, the early phase of national roll-out benefited 84 000 classrooms, and 63 000 tablets were distributed.<sup>769</sup> Professional development opportunities related to ICTs have also been put in place to support more than 680 000 teachers in the country.<sup>770</sup> With regard to distance learning, FATİH fostered the establishment of clusters as distance learning centres across all provinces to facilitate professional development in the future. Administrative support was strengthened: by 2018, there were 500 FATİH trainers in schools helping to solve school-level issues, with a further 700 rotating among schools.<sup>771</sup>

A 2020 OECD observation of the FATİH project indicates that the targeted coverage of digital infrastructure had reached 47 158 schools by 2019, exceeding the original target of 40 000 schools, and that ICT infrastructure installations in 47 158 schools are expected to be complete by the end of 2023.<sup>772</sup> By 2015, over 700 000 tablets had been distributed to upper secondary students and teachers in 81 cities.<sup>773</sup> By 2019, the number of tablets distributed had increased to over 1.4 million.<sup>774</sup> Moreover, nearly 475 000 interactive white boards were installed in classrooms by the first quarter of 2021, and approximately 1 million teachers had benefited from either online or onsite professional development.<sup>775</sup>

<sup>767</sup> EBA stands for Eğitim Bilişim Ağı ("Education Information Network"), which is a website designed and run by the Innovation and Educational Technologies General Directorate, affiliated with the Turkish Ministry of National Education. The network is the foundation portal that offers online access for teachers and students to course materials within the FATİH project.

<sup>768</sup> [www.researchgate.net/publication/315671141\\_FATIH\\_Project\\_in\\_Turkey\\_A\\_Case\\_Analysis](http://www.researchgate.net/publication/315671141_FATIH_Project_in_Turkey_A_Case_Analysis).

<sup>769</sup> [www.rti.org/publication/turkeys-fatih-project/fulltext.pdf](http://www.rti.org/publication/turkeys-fatih-project/fulltext.pdf).

<sup>770</sup> [www.rti.org/publication/turkeys-fatih-project/fulltext.pdf](http://www.rti.org/publication/turkeys-fatih-project/fulltext.pdf).

<sup>771</sup> [www.rti.org/publication/turkeys-fatih-project/fulltext.pdf](http://www.rti.org/publication/turkeys-fatih-project/fulltext.pdf).

<sup>772</sup> [www.oecd.org/education/policy-outlook/country-profile-Turkey-2020.pdf](http://www.oecd.org/education/policy-outlook/country-profile-Turkey-2020.pdf).

<sup>773</sup> [www.oecd-ilibrary.org/sites/a85d5b7b-en/index.html?itemId=/content/component/a85d5b7b-en](http://www.oecd-ilibrary.org/sites/a85d5b7b-en/index.html?itemId=/content/component/a85d5b7b-en).

<sup>774</sup> [www.oecd-ilibrary.org/sites/a85d5b7b-en/index.html?itemId=/content/component/a85d5b7b-en](http://www.oecd-ilibrary.org/sites/a85d5b7b-en/index.html?itemId=/content/component/a85d5b7b-en).

<sup>775</sup> [www.oecd.org/education/policy-outlook/country-profile-Turkey-2020.pdf](http://www.oecd.org/education/policy-outlook/country-profile-Turkey-2020.pdf).

In summary, a total of 3 100 schools in phase 1 and 11 750 schools in phase 2 have been actively connected to the Internet as a result of this project.<sup>776</sup> In 2020, approximately 13 800 schools were equipped with VPN broadband created exclusively for the FATİH project, and 13 229 schools have been actively using the service.<sup>777</sup> Moreover, some 2 072 schools without wired Internet network access are being provided with mobile networks, while 1 206 schools are receiving satellite Internet connections.<sup>778</sup> To monitor and evaluate the components of the FATİH project, a number of field studies have been conducted.<sup>779</sup>

In June 2020, the World Bank approved a EUR 143.8 million loan to Turkey for the Safe Schooling and Distance Education project, to be implemented by the Ministry of National Education. The goal of the project is to enhance the education system's capacity to provide e-learning equitably to school-age children during and following the COVID-19 pandemic and future shocks.<sup>780</sup> The project also intends to focus on the needs of vulnerable students—children and young people in remote areas, communities from low-income backgrounds, children with disabilities, refugee children and other non-native Turkish-speaking children.

More specifically, the project entails three main components:<sup>781</sup>

- Emergency connectivity and IT infrastructure for education in emergencies. This component finances the expansion of the country's e-learning platform, EBA, as part of the Ministry's response to COVID-19, and supports the development and roll-out of a new digital education system for the future.
- Digital content for safety and quality. This component finances goods, services, consultants, training and small refurbishments to support distance education during the period of school closures resulting from COVID-19 and a gradual return to classroom-based teaching and to strengthen blended teaching and learning (classroom-based and online).
- Institutional capacity for education technology resilience. This component will strengthen the Ministry's capacity to coordinate, manage, monitor and evaluate the project and the continued delivery of safe and equitable digital education services.

Concerning equity and connectivity, the project also includes strategies to support access to the Internet and digital resources. For students from poor and vulnerable families without Internet access or digital devices, the project will leverage partnerships with schools, municipalities and other organizations already supporting home-based schooling in low-income households with a view to extending these models in other areas. Vulnerability mapping and an analysis of how to close the digital gap are planned, and the project is expected to tackle potential social inequalities in access and outcomes.<sup>782</sup> Additionally, activities are planned to address gender-based distance education needs and risk mitigation, and monitoring indicators are disaggregated by gender.<sup>783</sup>

<sup>776</sup> [www.broadbandcommission.org/Documents/working-groups/SchoolConnectivity\\_report.pdf](http://www.broadbandcommission.org/Documents/working-groups/SchoolConnectivity_report.pdf).

<sup>777</sup> <http://fatihprojesi.meb.gov.tr/en/altyapi-erisim.html>.

<sup>778</sup> <http://fatihprojesi.meb.gov.tr/en/altyapi-erisim.html>.

<sup>779</sup> <https://yegitek.meb.gov.tr/www/egitim-teknolojileri-gelistirme-ve-projeler-daire-baskanliginda-yapilan-arastirmalar/icerik/3035>.

<sup>780</sup> [www.worldbank.org/en/events/2020/09/24/responding-to-covid-19-looking-beyond-lessons-from-turkeys-education-emergency-response-digital-education-reforms-for-new-way-of-teaching-learning](http://www.worldbank.org/en/events/2020/09/24/responding-to-covid-19-looking-beyond-lessons-from-turkeys-education-emergency-response-digital-education-reforms-for-new-way-of-teaching-learning).

<sup>781</sup> <http://documents1.worldbank.org/curated/en/788991593396173808/pdf/Turkey-Safe-Schooling-and-Distance-Education-Project.pdf>.

<sup>782</sup> <http://documents1.worldbank.org/curated/en/788991593396173808/pdf/Turkey-Safe-Schooling-and-Distance-Education-Project.pdf>.

<sup>783</sup> [www.worldbank.org/en/news/press-release/2020/06/25/responding-to-covid-19-and-looking-beyond-turkey-invests-in-safer-schooling-and-distance-education-with-the-world-bank-support](http://www.worldbank.org/en/news/press-release/2020/06/25/responding-to-covid-19-and-looking-beyond-turkey-invests-in-safer-schooling-and-distance-education-with-the-world-bank-support).

Furthermore, the second component, which will account for nearly one-third of the project's total budget, is directly related to broadband development in the school context. Under this umbrella, funds are expected to be used to support public partnerships for digital education and innovation by education stakeholders. This component also encompasses the establishment of an educational technology innovation hub—the Incubation and Innovation Centre for Educational Technologies—which will support the development, testing and roll-out of more than 20 000 new digital educational materials and pedagogical tools for general education, special education and blended learning.<sup>784</sup>

### 3.8.4 National responses to COVID-19 and educational initiatives for distance learning

On 13 March 2020 the Turkish Government announced the closure of schools at all levels of education as a way to slow down the spread of COVID-19 in the country.<sup>785</sup> According to an OECD-led assessment, policies implemented over recent years, such as the expansion of open education, the FATİH project (2010) and the higher education digital transformation project (2017) played an important role in Turkey's response to the need for online learning in the context of COVID-19.<sup>786</sup> This remains true as the country continues to rely heavily on distance learning in response to the COVID-19 pandemic.<sup>787</sup>

In mid-April 2020, the Ministry of National Education launched a free, hybrid, ad hoc television-and-online model to complement the EBA project,<sup>788</sup> which has become the cornerstone of Turkey's educational response to the COVID-19 pandemic. As a two-fold strategy for distance learning involving broadcasting lessons on television and—as a complementary catch-up measure—utilizing digital learning and teaching resources to deliver curriculum via EBA, the project covers the main subjects set out in the country's curriculum, serving nearly 18 million students<sup>789</sup> as well as their teachers and parents.<sup>790</sup> Three television channels have been reserved to undertake the project in the context of the pandemic,<sup>791</sup> including the creation of a new channel called Eğitim Bilişim Ağı TV<sup>792</sup> ("Educational Informatics Network TV" (EBA TV),<sup>793</sup> in a partnership between Turkish Radio Television and EBA).<sup>794</sup> As at 18 June 2021, the Ministry reported that EBA had been visited 23 769 308 322 times, and that 14 111 941 students and 1 177 725 teachers had actively benefited from the online EBA platform. The EBA mobile application has reached 31 million downloads for Android devices and 3.1 million downloads for iOS devices.<sup>795</sup>

<sup>784</sup> <http://documents1.worldbank.org/curated/en/788991593396173808/pdf/Turkey-Safe-Schooling-and-Distance-Education-Project.pdf>.

<sup>785</sup> [www.meb.gov.tr/bakan-selcuk-koronaviruse-karsi-egitim-alaninda-alinan-tedbirleri-acikladi/haber/20497/tr](http://www.meb.gov.tr/bakan-selcuk-koronaviruse-karsi-egitim-alaninda-alinan-tedbirleri-acikladi/haber/20497/tr).

<sup>786</sup> [www.oecd.org/education/policy-outlook/country-profile-Turkey-2020.pdf](http://www.oecd.org/education/policy-outlook/country-profile-Turkey-2020.pdf).

<sup>787</sup> <https://en.unesco.org/covid19/educationresponse#schoolclosures>.

<sup>788</sup> <http://eba.gov.tr/#/anasayfa>.

<sup>789</sup> [www.dailysabah.com/turkey/education/turkey-2nd-country-with-nationwide-remote-education-after-china-education-minister-says](http://www.dailysabah.com/turkey/education/turkey-2nd-country-with-nationwide-remote-education-after-china-education-minister-says).

<sup>790</sup> <https://medium.com/@goyucel/education-children-and-covid19-the-turkish-model-a8cd07d2c6f0>.

<sup>791</sup> [www.unicef.org/turkey/en/media/11411/file](http://www.unicef.org/turkey/en/media/11411/file).

<sup>792</sup> <https://epale.ec.europa.eu/sites/default/files/asas.pdf>.

<sup>793</sup> <https://help.unhcr.org/turkey/coronavirus/education-during-covid-19/>.

<sup>794</sup> <https://epale.ec.europa.eu/en/content/turkey-online-education-starts-amid-covid-19-outbreak>.

<sup>795</sup> <https://yegitek.meb.gov.tr/www/sayilarla-uzaktan-egitim/icerik/3237>.

While the EBA website was already under construction as early as 2011,<sup>796</sup> the local press reports that EBA has recently been re-developed in order to offer user-friendly, educational, suitable, reliable and accurate e-content for all grades, supported by smart technologies such as artificial intelligence and with a special academic support feature for 11<sup>th</sup> and 12<sup>th</sup> grades. Before the pandemic, in 2018, a report by the Ministry of National Education showed that EBA had already received nearly 1 billion visits,<sup>797</sup> which paved the way for it to become the cornerstone of distance learning in the context of COVID-19.

More recently, the platform also began to host live synchronous classes (with priority for those teaching national examination candidates) and to offer adaptive support tools powered by machine learning.<sup>798</sup> More specifically, as of 2 November 2020, all classes have been granted access to an unlimited number of live synchronous classes, and both pre-school students and students in grades 1 to 12 can follow an unlimited number of lessons between 8.30 a.m. and 8.20 p.m. every day except Sunday.<sup>799</sup> There are more than 1 900 lessons and more than 60 000 interactive content elements available.<sup>800</sup> Thousands of books and a question bank to be used by teachers are also available, and the online resources can be accessed via desktop, tablet, mobile phone and other smart devices. The three major mobile network operators in the country also offered 6 to 8 GB of free data access for those enrolling in the EBA platform.<sup>801</sup> Data from the EBA platform allows teachers and families to track students' progress and overall learning performance.<sup>802</sup> As at 18 June 2021, 300 122 722 hours of live synchronous classes have been held. In addition to the efforts above, an "assistant" function was integrated into EBA in order to respond instantly to user questions, solve problems and ensure that EBA is used effectively, complete with a free Internet package offered by agreement with mobile network operators.<sup>803</sup>

Despite these significant developments and outcomes, there are still many students, including refugees, who cannot participate in distance learning because they lack access to ICTs, high-speed Internet and a financially stable household.<sup>804</sup> To bridge these gaps, UNICEF has been supporting government efforts to make the EBA platform more inclusive. With UNICEF support, the Ministry of National Education has increased the bandwidth coverage for the EBA distance learning platform. In order to support students from disadvantaged backgrounds during school closures, the distribution of 664 157 free tablets with 25 GB of mobile LTE Internet access was finalized by the Ministry of National Education in the first quarter of 2021.<sup>805</sup>

With the initial reopening phase of schools in late August 2020, the Government also created EBA support points, which were established in schools and institutions to ensure network access for students who do not have a computer or Internet access at home.<sup>806</sup> The Ministry has established 15 330 EBA support points and 189 mobile centres throughout Turkey. UNICEF

<sup>796</sup> <https://epale.ec.europa.eu/sites/default/files/asas.pdf>.

<sup>797</sup> [http://sgb.meb.gov.tr/meb\\_iys\\_dosyalar/2019\\_03/01175437\\_Milliy\\_EYitim\\_BakanIYY\\_2018\\_YYIY\\_Ydare\\_Faaliyet\\_Raporu\\_YayYn2.pdf](http://sgb.meb.gov.tr/meb_iys_dosyalar/2019_03/01175437_Milliy_EYitim_BakanIYY_2018_YYIY_Ydare_Faaliyet_Raporu_YayYn2.pdf).

<sup>798</sup> [www.oecd.org/education/policy-outlook/country-profile-Turkey-2020.pdf](http://www.oecd.org/education/policy-outlook/country-profile-Turkey-2020.pdf).

<sup>799</sup> Information provided by BTK.

<sup>800</sup> Updated figures provided by the Ministry of National Education.

<sup>801</sup> [www.dailysabah.com/turkey/education/turkey-2nd-country-with-nationwide-remote-education-after-china-education-minister-says](http://www.dailysabah.com/turkey/education/turkey-2nd-country-with-nationwide-remote-education-after-china-education-minister-says).

<sup>802</sup> [www.oecd.org/education/policy-outlook/country-profile-Turkey-2020.pdf](http://www.oecd.org/education/policy-outlook/country-profile-Turkey-2020.pdf).

<sup>803</sup> <https://yegitek.meb.gov.tr/www/sayilarla-uzaktan-egitim/icerik/3237>; <https://yegitek.meb.gov.tr/www/eba-asistan-uzaktan-egitimde-cevapsiz-soru-birakmayacak/icerik/3043>; [www.eba.gov.tr/haber/1576501657](http://www.eba.gov.tr/haber/1576501657).

<sup>804</sup> <https://epale.ec.europa.eu/sites/default/files/asas.pdf>.

<sup>805</sup> [www.aa.com.tr/en/turkey/turkey-to-resume-distance-learning-as-of-nov-20/2048518](http://www.aa.com.tr/en/turkey/turkey-to-resume-distance-learning-as-of-nov-20/2048518); updated numbers provided by the Ministry of National Education.

<sup>806</sup> <https://covid19turkey.com/new-school-year-starts-in-turkey-with-distance-education/>.

has supported the creation of 170 EBA support centres, including 6 mobile centres, facilitating distance learning for some of the most marginalized learners, including Syrian refugee children and those without access to a computer or the Internet at home in Hatay, Ankara, Istanbul, Şanlıurfa, Kilis and Gaziantep provinces.<sup>807</sup> For example, EBA support classrooms for vulnerable children who need education support in accessing distance and online learning have been established in Hatay province.<sup>808</sup> As at 21 June 2021, the number of EBA support centres has reached 15 361.<sup>809</sup>

Additionally, the Ministry of National Education announced a collaboration with Turkish Radio Television and Türksat, whereby they launched three high definition and three standard definition education channels for all students in compulsory education. The Ministry offers hotline support via a call centre, staffed by 1 375 counsellors based across the country, to help students and their families. More than 2 000 vulnerable Syrian and Turkish children were provided with remote homework assistance, and more than 3 000 children, including more than 1 800 out-of-school children, were provided with support in language skills development through UNICEF-supported Turkish language courses provided by the Ministry of Youth and Sports, the Turkish Red Crescent and Kilis municipality. The programme was adapted and delivered remotely via phone, WhatsApp, and small, face-to-face group sessions, enabling refugee children to be integrated into local communities and Turkish public schools.<sup>810</sup>

Concerning inclusion and information sharing tailored to minority groups, UNICEF has collaborated with the Turkish government on sending information related to COVID-19 to support Syrian refugees using RapidPro SMS technology. The messages included tips on parenting during the COVID-19 pandemic, as well as information on school registration and distance learning.<sup>811</sup> Moreover, UNICEF reports that Syrian and vulnerable Turkish families across south-east Turkey continued to receive daily phone calls and WhatsApp messages from a network of more than 200 teachers, with tips, instructions and guidance for parents and caregivers on key early learning activities.<sup>812</sup> The Ministry has provided handbooks for parents with relevant information on how to help young people keep up with distanced classes.<sup>813</sup> Other projects on Syrian refugees and distance learning have also taken place with support from United Nations agencies,<sup>814</sup> as well as from NGOs such as Télécoms Sans Frontières.<sup>815</sup>

UNICEF and the Ministry of National Education have also begun writing an educational technologies strategy document to bring a technology perspective to some post-COVID-19 educational activities. This document is planned to serve as a framework for specific studies related to technology, such as STEM implementation, device distribution and school IT installations to be conducted by the Ministry of National Education.<sup>816</sup> Similarly, the Ministry has prepared post-epidemic school adaptation guides and activities books to help students return to their normal routine when in-person learning recommences and to aid young people

<sup>807</sup> UNICEF Europe and Central Asia Region COVID-19 response in education questionnaire, March 2021.

<sup>808</sup> <https://reliefweb.int/report/turkey/unicef-turkey-covid-19-response-monthly-situation-report-october-2020>.

<sup>809</sup> <https://ebadesteknoktasi.meb.gov.tr/>.

<sup>810</sup> UNICEF Europe and Central Asia Region COVID-19 response in education questionnaire, March 2021.

<sup>811</sup> <https://reliefweb.int/report/turkey/unicef-turkey-covid-19-response-monthly-situation-report-october-2020>.

<sup>812</sup> <https://reliefweb.int/report/turkey/unicef-turkey-covid-19-response-monthly-situation-report-october-2020>.

<sup>813</sup> <https://medium.com/@goyucel/education-children-and-covid19-the-turkish-model-a8cd07d2c6f0>.

<sup>814</sup> <https://reliefweb.int/report/turkey/coronavirus-forces-classroom-learning-go-online-across-world-project-syrian-refugees>.

<sup>815</sup> <https://www.eurasia.undp.org/content/rbec/en/home/stories/turkey-syrian-refugee-distance-learning-lesson-for-coronavirus.html>.

<sup>816</sup> Information provided by the Ministry of National Education.

and school staff in coping with the effects of the pandemic. These guides and activities were used when face-to-face education gradually restarted in schools at the beginning of the 2020-2021 academic year.

In addition, the Turkish Government has continued with numerous courses for teachers via both EBA and a YouTube channel. With support from UNESCO, Turkey developed 17 new online courses aimed at reaching around 125 000 teachers during school closures. UNICEF has also supported needs-based training in delivering distance learning, reaching more than 196 000 teachers by the end of 2020.<sup>817</sup>

## 3.9 Ukraine

### 3.9.1 Overview of the education system and status of broadband

In accordance with Article 53 of the Constitution of Ukraine, everyone has the right to education.<sup>818</sup> In addition to ensuring accessible and free education, the Constitution also states that citizens who belong to national minorities are guaranteed, in accordance with the law, the right to receive instruction in their native language or to study their native language in state and communal educational establishments and through national cultural societies.<sup>819</sup> With recent reforms, the new Education Act of 5 September 2017, No. 2145-VIII, considers education the basis for the intellectual, spiritual, physical and cultural development of individuals and for collective values for the country's development.<sup>820</sup> In 2018, compulsory schooling in Ukraine was extended from 11 to 12 years, and it now includes four years of primary education, five years of middle school education and three years of upper secondary (specialized) education. Education is compulsory until 12<sup>th</sup> grade.<sup>821</sup>

In terms of organization, Ukraine operates a centralized education system<sup>822</sup> managed by the Ministry of Education and Science, which is located in the country's capital, Kyiv. In total, more than 5 million students are enrolled in pre-primary to upper-secondary education in Ukraine.<sup>823</sup> According to UNESCO data, in 2019 about 1.7 million pupils attended primary school.<sup>824</sup> The number of schools in Ukraine is 16 317. Of these, 16 176 institutions are for secondary education; they have about 3.9 million students and employ 441 000 teachers.<sup>825</sup> According to UNESCO data for 2019, the number of students enrolled in secondary school is lower, at 2.4 million,<sup>826</sup> and the number of teachers in secondary education is 312 000.<sup>827</sup>

Data show that the number of students in the school system has declined by 41 per cent since Ukraine's independence in 1991: from 7.1 to 4.2 million.<sup>828</sup> However, over that same period,

<sup>817</sup> UNICEF Humanitarian Action for Children regional indicator reporting.

<sup>818</sup> <https://rm.coe.int/constitution-of-ukraine/168071f58b>.

<sup>819</sup> <https://rm.coe.int/constitution-of-ukraine/168071f58b>.

<sup>820</sup> <https://cis-legislation.com/document.fwx?rgn=101022>.

<sup>821</sup> [https://wenr.wes.org/2019/06/education-in-ukraine#:~:text=Since%202018%2C%20Ukrainian%20school%20education,upper%20secondary%20\(specialized\)%20education.&text=Elementary%20education%20starts%20at%20the.is%20four%20years%20in%20length](https://wenr.wes.org/2019/06/education-in-ukraine#:~:text=Since%202018%2C%20Ukrainian%20school%20education,upper%20secondary%20(specialized)%20education.&text=Elementary%20education%20starts%20at%20the.is%20four%20years%20in%20length).

<sup>822</sup> <https://wenr.wes.org/2019/06/education-in-ukraine>.

<sup>823</sup> [https://en.wikipedia.org/wiki/Impact\\_of\\_the\\_COVID-19\\_pandemic\\_on\\_education](https://en.wikipedia.org/wiki/Impact_of_the_COVID-19_pandemic_on_education).

<sup>824</sup> <http://data.uis.unesco.org/#> (indicator: enrolment in primary education, both sexes).

<sup>825</sup> [https://mon.gov.ua/eng/tag/zagalna-serednya-osvita?&type=all&tag=Preschool%20Education&date\\_from=&date\\_to=](https://mon.gov.ua/eng/tag/zagalna-serednya-osvita?&type=all&tag=Preschool%20Education&date_from=&date_to=).

<sup>826</sup> <http://data.uis.unesco.org/#> (indicator: enrolment in secondary education, both sexes).

<sup>827</sup> <http://data.uis.unesco.org/#> (indicator: teachers in secondary education, both sexes).

<sup>828</sup> [www.worldbank.org/en/news/opinion/2018/09/12/why-ukraines-education-system-is-not-sustainable](http://www.worldbank.org/en/news/opinion/2018/09/12/why-ukraines-education-system-is-not-sustainable).



the number of schools declined by only 11 per cent and the number of teachers fell by just 5 per cent.<sup>829</sup> This means Ukraine now has one teacher for every nine students, resulting in one of the lowest average pupil-to-teacher ratios in the world. The completion rate for primary-school was 99.6 per cent in 2012.<sup>830</sup> However, the completion rate for young people in upper secondary education was 96.8 per cent the same year.<sup>831</sup> Still, as of 2014, there were close to 259 000 children and adolescents of primary to upper-secondary age out of school in the country,<sup>832</sup> the largest number after Turkey among the nine countries in this study. These figures, however, are outdated, demonstrating a need for up-to-date, timely and reliable data for decision-making.

UNESCO data indicate that the literacy rate for the 15-24 years age group in Ukraine was 99.97 per cent in 2012. UNICEF calculations using the latest available UIS and OECD PISA data estimate that just under half, or 46.7 per cent, of students in Ukraine do not achieve minimum proficiency in foundational skills.<sup>833</sup> Notably, the rate of 15-year-olds not achieving basic proficiency, at 36 per cent, is the lowest among the nine countries in this study, but still equates to more than 215 000 students who do not acquire the foundational skills needed for further learning, skills development and meaningful employment.

School funding is provided through an education subsidy. Specifically, all school funds are channelled through the Ministry of Education and Science and sent directly to regions and districts, where they ultimately are distributed to schools.<sup>834</sup> Ukraine is known for having one of the highest rates of public spending on education in the world. The most recent data show that the country's public spending on education and training was 5.4 per cent of GDP in 2017,<sup>835</sup> while the EU average for the same year was 4.7 per cent.<sup>836</sup> Despite this large quantity of funds, education financing decreased by 1.2 per cent from 2013 to 2017. However, the Ukrainian Government is currently planning to devote at least 7 per cent of GDP to education, although how such increased funding will be allocated is still in discussion. As assessed by the World Bank, inequality persists in the educational system, and infrastructure that enables effective and sustainable learning has been inadequate, resulting in a significant impact on teachers.<sup>837</sup>

Concerning broadband development in the country, ITU data show that 70.1 per cent of individuals used the Internet in 2020,<sup>838</sup> with the majority being in urban areas. In 2020, the number of fixed-broadband subscriptions per 100 inhabitants was 18.6,<sup>839</sup> and DSL remains the most widely used technology platform, while optical fibre continues to grow as a result

<sup>829</sup> [www.worldbank.org/en/news/opinion/2018/09/12/why-ukraines-education-system-is-not-sustainable](http://www.worldbank.org/en/news/opinion/2018/09/12/why-ukraines-education-system-is-not-sustainable).

<sup>830</sup> [https://data.unicef.org/resources/data\\_explorer/unicef\\_f/?ag=UNICEF&df=GLOBAL\\_DATAFLOW&ver=1.0&dq=MKD.ED\\_CR\\_L1+ED\\_CR\\_L3+ED\\_ANAR\\_L3+ED\\_15-24\\_LR.&startPeriod=2011&endPeriod=2020](https://data.unicef.org/resources/data_explorer/unicef_f/?ag=UNICEF&df=GLOBAL_DATAFLOW&ver=1.0&dq=MKD.ED_CR_L1+ED_CR_L3+ED_ANAR_L3+ED_15-24_LR.&startPeriod=2011&endPeriod=2020).

<sup>831</sup> [https://data.unicef.org/resources/data\\_explorer/unicef\\_f/?ag=UNICEF&df=GLOBAL\\_DATAFLOW&ver=1.0&dq=GEO.ED\\_CR\\_L1+ED\\_CR\\_L3+ED\\_ANAR\\_L3+ED\\_15-24\\_LR.T&startPeriod=2014&endPeriod=2020](https://data.unicef.org/resources/data_explorer/unicef_f/?ag=UNICEF&df=GLOBAL_DATAFLOW&ver=1.0&dq=GEO.ED_CR_L1+ED_CR_L3+ED_ANAR_L3+ED_15-24_LR.T&startPeriod=2014&endPeriod=2020).

<sup>832</sup> <http://data.uis.unesco.org/#> (indicator: out-of-school children, adolescents and youth of primary and secondary school age, both sexes).

<sup>833</sup> UNICEF calculation of the number of students in primary, lower secondary and upper secondary not achieving minimum proficiency in mathematics; data for Ukraine are based on the latest available figures from UIS and OECD PISA data (<http://uis.unesco.org/country/UA>).

<sup>834</sup> [www.democracyhouse.com.ua/en/2017/english-education-system-in-ukraine-financing-ranking-and-reform-directions/](http://www.democracyhouse.com.ua/en/2017/english-education-system-in-ukraine-financing-ranking-and-reform-directions/).

<sup>835</sup> <http://data.uis.unesco.org/#> (indicator: government expenditure on education as a percentage of GDP).

<sup>836</sup> <https://data.worldbank.org/indicator/SE.XPD.SECO.PC.ZS?locations=EU>.

<sup>837</sup> [www.worldbank.org/en/news/opinion/2018/09/12/why-ukraines-education-system-is-not-sustainable](http://www.worldbank.org/en/news/opinion/2018/09/12/why-ukraines-education-system-is-not-sustainable).

<sup>838</sup> ITU World Telecommunication/ICT Indicators Database online (2021), available at <http://handle.itu.int/11.1002/pub/81550f97-en> (indicator i99H).

<sup>839</sup> ITU World Telecommunication/ICT Indicators Database online (2021), available at <http://handle.itu.int/11.1002/pub/81550f97-en> (indicator i992b).

of efforts by operators to build networks based on fibre-to-the-premises.<sup>840</sup> While most cities have access to fibre-optic networks operated by several private stakeholders, the urban-rural gap in Internet coverage is significant in Ukraine, given that the country has more than 17 000 settlements not covered by this technology.<sup>841</sup>

The Government recently announced that about 65 per cent of Ukrainian villages are not covered by high-quality broadband, which corresponds to about 5.75 million citizens.<sup>842</sup> For rural areas not covered by optical fibre, the cost of connection exceeds the average market cost by around 150. In 2021, the Ministry of Digital Transformation plans to use a grant of UAH 500 million to deploy fibre-optic networks in rural areas, which will connect over 1 400 schools and 1 100 pre-school education institutions (for a total of more than 11 000 elements of social infrastructure) located in 3 500 villages where about 1.2 million Ukrainians live.<sup>843</sup>

In 2019, the number of active mobile-broadband subscriptions per 100 inhabitants was 47.2.<sup>844</sup> Over the past years, significant investment has been made in extending 3G infrastructure, while operators have more recently concentrated on LTE. Kyivstar, Ukraine's largest operator, announced that 3G coverage reached nearly 80 per cent in 2018, although a large portion of the country still lacks 4G/LTE coverage.<sup>845</sup> With the recent expansion of LTE in Ukraine, it is expected that the majority of the country's territory will be covered in the coming years.<sup>846</sup> Continued growth in community wireless platforms based on Wi-Fi and WiMAX technologies is expected to attract investments and shape the average price for Internet connectivity.<sup>847</sup>

Additionally, data from ITU show that 78.1 per cent of the population in Ukraine had 4G/LTE coverage in 2019, while 3G coverage was 99.9 per cent in 2020.<sup>848</sup> More specifically, in July 2020, mobile operators launched 4G/LTE 900 MHz networks in all regions of Ukraine, alternating from west to east. According to licensing conditions, by July 2022, high-speed mobile Internet coverage should be provided in all settlements with a population of more than 2 000 people, with each licensee covering at least 90 per cent of the population of Ukraine. Such licences also call for the provision of 4G coverage on national and international roads by January 2023 and July 2024, respectively.<sup>849</sup> By May 2021, 4G/LTE coverage was available in all operating stations and tunnels of the Kyiv metro—the result of a partnership between the country's mobile network operators and Huawei.<sup>850</sup>

As of December 2020, Ukraine did not have a nationwide broadband mapping system in place. However, the Ministry of Digital Transformation has started a collaboration with the World Bank to adopt a state policy for broadband access and to update basic legislation to

<sup>840</sup> [www.reportlinker.com/p05355157/Ukraine-Telecoms-Mobile-and-Broadband-Statistics-and-Analyses.html?utm\\_source=PRN](http://www.reportlinker.com/p05355157/Ukraine-Telecoms-Mobile-and-Broadband-Statistics-and-Analyses.html?utm_source=PRN).

<sup>841</sup> For more information please check: <https://data.gov.ua/dataset/>.

<sup>842</sup> <https://thedigital.gov.ua/news/17-tisyach-naselenikh-punktiv-ne-mayut-zhodnogo-optichnogo-provaydera-doslidzhennya-mintsifri>.

<sup>843</sup> Information provided by the State Service of Special Communications and Information Protection.

<sup>844</sup> ITU World Telecommunication/ICT Indicators Database online (2020), available at <http://handle.itu.int/11.1002/pub/81550f97-en> (indicator i992b).

<sup>845</sup> [www.epravda.com.ua/publications/2018/03/15/634981/](http://www.epravda.com.ua/publications/2018/03/15/634981/).

<sup>846</sup> [www.president.gov.ua/en/news/zhittya-dedali-bilshe-perehodit-v-onlajn-krayinu-treba-zyedn-61061](http://www.president.gov.ua/en/news/zhittya-dedali-bilshe-perehodit-v-onlajn-krayinu-treba-zyedn-61061).

<sup>847</sup> [www.reportlinker.com/p05355157/Ukraine-Telecoms-Mobile-and-Broadband-Statistics-and-Analyses.html?utm\\_source=PRN](http://www.reportlinker.com/p05355157/Ukraine-Telecoms-Mobile-and-Broadband-Statistics-and-Analyses.html?utm_source=PRN).

<sup>848</sup> ITU World Telecommunication/ICT Indicators Database online (2020), available at <http://handle.itu.int/11.1002/pub/81550f97-en> (indicators i271G and i271GA).

<sup>849</sup> Information provided by the State Service of Special Communications and Information Protection.

<sup>850</sup> <https://thedigital.gov.ua/news/shche-7-stansiy-kiivskogo-metro-pidklyucheni-do-4g>; updated information provided by the State Service of Special Communications and Information Protection.

support the development of broadband mapping with regard to fixed-broadband coverage (therefore presumably focusing on service mapping).<sup>851</sup> This activity falls under the scope of the project “Eastern Partnership Countries (EaP) Broadband Infrastructure Development Strategy”, financed by the EU4Digital project, which has produced a report on broadband mapping recommendations. Consequently, this will provide an in-depth assessment of the legal framework, as along with recommendations on the actions to be undertaken from both the regulatory and technical perspective to advance broadband mapping, thereby endowing the country with an important tool for policy-making aimed at advancing broadband development.<sup>852</sup>

### 3.9.2 Government strategies, status of education quality, and the role of ICTs

In 2013, the Ukrainian Government launched its National Strategy for the Development of Education in Ukraine for the period up to 2021. There are two overarching goals that the strategy encompasses: (i) to increase the availability of high-quality, competitive education to every citizen, in accordance with the requirements of innovative sustainable development; and (ii) to ensure the personal development of citizens in accordance with their individual abilities, needs and aspirations in life.<sup>853</sup>

The strategic directions of state policy in the field of education should focus on:<sup>854</sup>

- Reforming the education system, which will be based on the principle of prioritizing the individual;
- Updating the regulatory framework of the education system to meet contemporary requirements;
- Modernizing the structure, content and organization of education in line with a competency-based approach;
- Creating and providing opportunities for the implementation of various educational models, and establishing educational institutions of various types and forms of ownership;
- Building an effective national system for the education, development and socialization of children and young people;
- Ensuring the availability and continuity of lifelong learning;
- Cultivating a safe educational environment and “greening” education;
- Accelerating the development of scientific and innovative activities in education and improving the quality of education on an innovative basis;
- Modernizing the informatization of education, with a focus on improving the provision of library and information resources in education and science;
- Ensuring national monitoring of the education system;
- Raising the social status of educators and educational theorists; and
- Creating a modern material and technical basis for the education system.

<sup>851</sup> <https://thedigital.gov.ua/news/mintsifra-ta-svitoviy-bank-rozpochinayut-spivpratsyu-zi-svitovim-bankom>.

<sup>852</sup> [www.itu.int/en/ITU-D/Regional-Presence/Europe/Documents/Events/2020/RRF/20-11-26%20Background%20Paper\\_Broadband%20Mapping%20Systems%20in%20Europe%20and%20Regional%20Harmonization%20Initiatives\\_final.pdf](http://www.itu.int/en/ITU-D/Regional-Presence/Europe/Documents/Events/2020/RRF/20-11-26%20Background%20Paper_Broadband%20Mapping%20Systems%20in%20Europe%20and%20Regional%20Harmonization%20Initiatives_final.pdf).

<sup>853</sup> <https://zakon.rada.gov.ua/laws/show/344/2013#n10>.

<sup>854</sup> [http://oneu.edu.ua/wp-content/uploads/2017/11/nsro\\_1221.pdf](http://oneu.edu.ua/wp-content/uploads/2017/11/nsro_1221.pdf).

According to 2018 OECD PISA results,<sup>855</sup> Ukrainian students' scores for reading, mathematics and science were below the OECD average.<sup>856</sup> PISA 2018 results also show that socio-economically advantaged students outperformed disadvantaged students in reading by 90 points, not significantly different from the average gap between the two groups (89 points) across OECD countries.<sup>857</sup> The data indicate that only 25.9 per cent of students in Ukraine achieved reading literacy, 36 per cent achieved mathematical competency, and 26.4 per cent achieved minimum standards in natural science.<sup>858</sup> Moreover, in Ukraine, low- and high-performing students are clustered in the same schools to the same extent as the OECD average.<sup>859</sup> Concerning school infrastructure and staff availability, school principals in Ukraine reported fewer staff shortages and more material shortages than the OECD average. However, there was no significant difference in staff shortages between advantaged and disadvantaged schools.<sup>860</sup>

While Ukraine has high rates of enrolment in pre-primary education by international standards, access remains unequal.<sup>861</sup> For example, in urban areas, the net enrolment rate for children aged three to five is 85 per cent on average nationwide, compared to 58 per cent in rural areas.<sup>862</sup> Socio-economic inequality from an early age persists as students progress up the educational ladder, which prevents them from acquiring the foundational skills needed to succeed in higher education or the labour market. Rural areas in the country lack learning materials,<sup>863</sup> and there are more likely to be shortages of subject teachers for ICTs.<sup>864</sup>

However, some of the most vulnerable children and students in Ukraine live in close proximity to the "contact line" between the government-controlled area and the non-government-controlled area. According to a 2020 report by the United Nations Office for the Coordination of Humanitarian Affairs, the armed conflict in eastern Ukraine has led to a chaotic and fragmented educational system, affecting nearly 657 000 school-age children living in the region. Another study, by the Organization for Security and Co-operation in Europe, shows that at least 93 educational facilities have been damaged in more than 40 settlements across the Luhansk and Donetsk provinces. In the context of COVID-19, more than half of children residing near the contact line were left without adequate access to education during quarantine and unable to follow distance learning assignments, given that they lacked equipment and Internet access.<sup>865</sup>

<sup>855</sup> PISA tests the reading, mathematics and science performance of 15-year-old pupils across the world every three years. In the context of the European Union, PISA results are particularly important because they feed into the Education and Training 2020 strategic cooperation framework (ET2020). They form the basis for one of the ET2020 benchmarks: the rate of underachievers in reading, mathematics or science among 15-year-olds in the EU should be less than 15 per cent by 2020. Underachievers in PISA are those pupils who fail to reach the minimum proficiency level necessary to participate successfully in society. More information on the PISA indicators and ET2020 is available at [https://ec.europa.eu/education/sites/education/files/document-library-docs/pisa-2018-eu\\_1.pdf](https://ec.europa.eu/education/sites/education/files/document-library-docs/pisa-2018-eu_1.pdf).

<sup>856</sup> [www.oecd.org/pisa/publications/PISA2018\\_CN\\_UKR.pdf](http://www.oecd.org/pisa/publications/PISA2018_CN_UKR.pdf).

<sup>857</sup> [www.oecd.org/pisa/publications/PISA2018\\_CN\\_UKR.pdf](http://www.oecd.org/pisa/publications/PISA2018_CN_UKR.pdf).

<sup>858</sup> <https://ukranews.com/en/news/670187-study-of-quality-of-education-pisa-2018-shows-unacceptably-low-level-of-education-in-ukraine>.

<sup>859</sup> [www.oecd.org/pisa/publications/PISA2018\\_CN\\_UKR.pdf](http://www.oecd.org/pisa/publications/PISA2018_CN_UKR.pdf).

<sup>860</sup> [www.oecd.org/pisa/publications/PISA2018\\_CN\\_UKR.pdf](http://www.oecd.org/pisa/publications/PISA2018_CN_UKR.pdf).

<sup>861</sup> [www.worldbank.org/en/news/opinion/2018/09/12/why-ukraines-education-system-is-not-sustainable](http://www.worldbank.org/en/news/opinion/2018/09/12/why-ukraines-education-system-is-not-sustainable).

<sup>862</sup> <http://documents1.worldbank.org/curated/en/884261568662566134/pdf/Review-of-the-Education-Sector-in-Ukraine-Moving-toward-Effectiveness-Equity-and-Efficiency-RESUME3.pdf>.

<sup>863</sup> <https://nomadit.co.uk/conference/easa2016/paper-download/paper/29734>.

<sup>864</sup> <http://documents1.worldbank.org/curated/en/884261568662566134/pdf/Review-of-the-Education-Sector-in-Ukraine-Moving-toward-Effectiveness-Equity-and-Efficiency-RESUME3.pdf>.

<sup>865</sup> <https://reliefweb.int/report/ukraine/ocha-ukraine-situation-report-28-september-2020-enruuk>.

The 2017 Education Act and a concept paper entitled “The New Ukrainian School”<sup>866</sup> address the country’s need for new curricula and other reforms. Elements of the “new Ukrainian school” concept include: (i) school curricula focused on 21<sup>st</sup>-century skills and competencies; (ii) professional development for teachers, emphasizing student-centred learning; (iii) system management and school administration, emphasizing greater local decision-making powers; and (iv) a different role for central government, with a focus on setting and monitoring learning standards. The actions for these and other goals can be broken down into three main phases: phase I (2016-2018), phase II (2019-2022), and phase III (2023-2029). It is the role of the State Inspectorate of Educational Institutions of Ukraine to oversee matters related to quality assurance, curriculum development, teaching methodology, examinations within the school system, and vocational education.<sup>867</sup>

Since 2016, all education institutions have been required to record and provide educational data. To make this possible, Ukraine’s Ministry of Education and Science established the Institute of Educational Analytics<sup>868</sup> in 2014.<sup>869</sup> Its mandate is to collect, analyse and disseminate education data, which is available on the “Open Data” section of its website.<sup>870</sup> The combined legal framework of ministerial orders, decrees and the Institute’s Statute ensure that data from all primary and secondary schools are captured and validated in the State Information System for Education, an existing, functioning EMIS that is managed by the Institute. As shown in a 2014 World Bank report, data collection on schools focuses primarily on administrative data, but does not include financial, human resource or learning outcome data. The existing EMIS is not integrated with other education sector databases, nor are there provisions on facilitating inter-ministry data sharing. Based on clear data stipulations, responsibilities and timelines, local education departments oversee the process of data entry and check data for accuracy. Despite that, local governments in Ukraine lack the ability to produce sophisticated education analyses, meaning data are barely used in their decision-making processes.<sup>871</sup>

Furthermore, “The New Ukrainian School” acknowledges the importance of ICTs both in the education process and in the management of educational institutions. The plan also lists ICTs and digital skills as one of the 10 key competencies for the education system. The overarching goal points to the need to harmonize all levels of education both in the liberal arts and humanities and in science and technology, maintaining good traditions and securing a high level of education in science and ICT in every school.<sup>872</sup>

In December 2019, the Ministry of Digital Transformation estimated the extent of digital literacy among the public. The results show that 37.9 per cent of Ukrainians aged 18-70 score below average in terms of digital skills. Another 15.1 per cent do not have access to ICTs at all. This means that 53 per cent of Ukrainians are below the average level, according to the assessment methodology of the European Commission.<sup>873</sup>

<sup>866</sup> <https://mon.gov.ua/storage/app/media/zagalna%20serednya/Book-ENG.pdf>.

<sup>867</sup> [https://wenr.wes.org/2019/06/education-in-ukraine#:~:text=Since%202018%2C%20Ukrainian%20school%20education,upper%20secondary%20\(specialized\)%20education.&text=Elementary%20education%20starts%20at%20the,is%20four%20years%20in%20length.](https://wenr.wes.org/2019/06/education-in-ukraine#:~:text=Since%202018%2C%20Ukrainian%20school%20education,upper%20secondary%20(specialized)%20education.&text=Elementary%20education%20starts%20at%20the,is%20four%20years%20in%20length.)

<sup>868</sup> <https://iea.gov.ua/en/>.

<sup>869</sup> <http://documents1.worldbank.org/curated/en/242991505976233066/pdf/119782-BRI-PUBLIC-SABER-EMIS-Ukraine-Country-Report-Final-2017.pdf>.

<sup>870</sup> <http://opendata.iea.gov.ua/>.

<sup>871</sup> <http://documents1.worldbank.org/curated/en/242991505976233066/pdf/119782-BRI-PUBLIC-SABER-EMIS-Ukraine-Country-Report-Final-2017.pdf>.

<sup>872</sup> <https://mon.gov.ua/storage/app/media/zagalna%20serednya/Book-ENG.pdf>.

<sup>873</sup> <https://ms.detector.media/mediadoslidzhennya/post/23983/2019-12-24-15-ukraintsiv-ne-volodiyut-tsfrovimi-navichkami-doslidzhennya-mintsifri/>.

In July 2020, the Ministry of Digital Transformation published details of a study on the availability of public access to high-speed fixed Internet, which showed that 17 000 settlements in the country do not have optical networks at all.<sup>874</sup> A list of locations is available on an open data portal.<sup>875</sup> A map of fibre-optic network coverage can also be accessed freely.<sup>876</sup> According to the data, all cities have fibre-optic networks. However, about 65 per cent of villages are not covered by high-quality broadband.

In addition, according to the National Broadband Development Strategy and Implementation Plan 2020-2025, at the level of primary and secondary educational institutions, only a few schools are connected to broadband with optimal speeds of 100 Mbit/s and the possibility of upgrading to 1 Gbit/s. At the same time, it should be noted that over half of Ukraine's schools have subscriptions offering at least 50 Mbit/s, with the exception of Zakarpatska province (49 per cent). The low level of digital connectivity in schools does not allow for the effective implementation of key initiatives from the Ministry of Education and Science and is hindering the decentralization of the primary and secondary education sector.<sup>877</sup>

According to the State Statistics Service of Ukraine, there was one school computer for every 16 students in 2017, amounting to approximately 280 000 PCs available in the country for educational purposes. In 2011, that number was 27.<sup>878</sup> More recent statistics illustrate that 364 652 PCs are available in schools, 262 048 of which are connected to the Internet.<sup>879</sup> Regarding Internet connectivity, local press reports suggest that most schools in urban areas can afford to connect to high-speed Internet using local budgets; however, there are still thousands of schools across the country that need government assistance in this regard. According to research by the Ministry of Digital Transformation during the 2019-2020 period, tenders were held for installing Internet connections and local area networks in almost 10 000 Ukrainian schools. Indicators reveal that there are 16 317 schools in Ukraine, about 60 per cent of which (9 773) have an Internet connection using fibre-optic technologies, while 40 per cent (6 544) lack Internet infrastructure.<sup>880</sup> Most of these institutions are located in villages and small towns. The Ministry has developed an interactive map plotting all Ukrainian school connectivity data.<sup>881</sup>

However, in the context of the challenges that emerged during the COVID-19 pandemic, discussions of Internet connectivity in schools presented different reference data. According to an internal assessment by the Ministry of Education and Science, there were only 74 schools in Ukraine that were not equipped with Internet facilities by September 2020. According to the Ministry, these are schools located in either mountainous or northern areas or in various locations of the Odessa region.<sup>882</sup> At the beginning of 2020, 750 schools in Ukraine were not connected to the Internet.<sup>883</sup>

<sup>874</sup> <https://thedigital.gov.ua/news/17-tisyach-naselenikh-punktiv-ne-mayut-zhodnogo-optichnogo-provaydera-doslidzhennya-mintsifri>.

<sup>875</sup> <https://data.gov.ua/dataset/788580dd-e3ae-45b4-a93b-f7f3e8a3f80d>.

<sup>876</sup> <https://thedigital.gov.ua/fiber>.

<sup>877</sup> <https://documents1.worldbank.org/curated/en/896591621848142525/pdf/A-National-Broadband-Development-Strategy-and-Implementation-Plan-Recommendations-to-the-Ministry-of-Digital-Transformation-Government-of-Ukraine.pdf>.

<sup>878</sup> <http://ceur-ws.org/Vol-2105/10000302.pdf>.

<sup>879</sup> [http://www.ukrstat.gov.ua/operativ/operativ2021/osv/osv\\_rik/zcpho\\_Ukr\\_2020.xls](http://www.ukrstat.gov.ua/operativ/operativ2021/osv/osv_rik/zcpho_Ukr_2020.xls).

<sup>880</sup> <https://glavcom.ua/country/science/v-ukrajini-40-shkil-ne-mayut-yakisnogo-pidklyuchennya-do-Internet-u-doslidzhennya-686007.html>.

<sup>881</sup> [https://thedigital.gov.ua/bb\\_schools](https://thedigital.gov.ua/bb_schools).

<sup>882</sup> <https://education.24tv.ua/shkarlet-rozpoviv-vsi-shkoli-zabezpecheni-Internet-om-novini-tehnologiy-n1415234>.

<sup>883</sup> <https://mon.gov.ua/ua/news/sergij-shkarlet-zaraz-lishe-74-shkoli-v-ukrajini-ne-pidklyucheno-do-internetu>.

### 3.9.3 Multistakeholder partnerships and financing mechanisms fostering investment in school connectivity

In the 2002 National Doctrine of Education Development, the Ukrainian Government prioritized the use of ICTs for the development of a cohesive national education system. Through this early document, the Government signalled its intention to support the process of informatization of education and the use of ICTs in the education system; the Government promotes the provision of educational institutions with computers and modern learning tools and the creation of global information and education networks.<sup>884</sup> While various action plans and subsequent initiatives have been launched—such as the 2013 Strategy for the Development of the Information Society—it has been since 2018, in particular, that various joint initiatives between the public and private sectors have come about to strengthen the provision and adequate use of digital technologies in educational settings.<sup>885</sup>

In January 2017, the Chinese Government gave 23 500 new computers to 2 400 schools across the country, which was part of a broader contribution by China supporting the development of education in Ukraine.<sup>886</sup> The Government stated that the Chinese contribution would allow the country to introduce computer classes, such as programming, into the national curriculum.<sup>887</sup> In the past, China has donated computers and other IT equipment to Ukraine to be used in schools.<sup>888</sup>

In January 2018, the Government and State Agency for e-Governance of Ukraine published a new Digital Agenda for Ukraine 2020,<sup>889</sup> which aims to guide the country's digital development. The agenda has seven main pillars: (i) telecommunications and ICT infrastructure; (ii) digital skills; (iii) e-market; (iv) digital governance; (v) innovation and R&D; (vi) trust and cybersecurity; and (vii) benefits of ICT for society and the economy.<sup>890</sup> The digitalization of education is listed as one of the priority sectors alongside other initiatives aiming to bridge the digital divide through the development of digital infrastructure.<sup>891</sup>

According to the Ministry of Education and Science, a total subsidy of EUR 29.16 million (UAH 1 billion)<sup>892</sup> was included in the budget for 2019 for the “Internet-ization” and computerization of schools in Ukraine.<sup>893</sup> The Government's plan for using these funds included the acquisition of computer equipment for students and teachers and the expansion of high-speed Internet in schools. To avoid the mismanagement of funds, the Government reports that their distribution would be based on a predetermined algorithm that takes into account the following criteria:<sup>894</sup>

<sup>884</sup> <http://ceur-ws.org/Vol-2105/10000302.pdf>.

<sup>885</sup> [www.etf.europa.eu/sites/default/files/2020-06/digital\\_factsheet\\_ukraine.pdf](http://www.etf.europa.eu/sites/default/files/2020-06/digital_factsheet_ukraine.pdf).

<sup>886</sup> [www.slovoidilo.ua/2017/01/11/novyna/suspilstvo/ukrayinski-shkoly-otrymaly-kompyutery-vid-kytayu](http://www.slovoidilo.ua/2017/01/11/novyna/suspilstvo/ukrayinski-shkoly-otrymaly-kompyutery-vid-kytayu).

<sup>887</sup> [www.xinhuanet.com/english/2017-01/12/c\\_135974622.htm](http://www.xinhuanet.com/english/2017-01/12/c_135974622.htm).

<sup>888</sup> <https://molbuk.ua/ukraine/44195-kitay-daruye-kompyuteri-700-shkolam-ukrayini.html>.

<sup>889</sup> [https://issuu.com/mineconomdev/docs/digital\\_agenda\\_ukraine-v2\\_1\\_](https://issuu.com/mineconomdev/docs/digital_agenda_ukraine-v2_1_).

<sup>890</sup> [www.e-ukraine.org.ua/media/Lviv\\_Minich\\_2.pdf](http://www.e-ukraine.org.ua/media/Lviv_Minich_2.pdf).

<sup>891</sup> [www.kmu.gov.ua/npas/pro-shvalennya-koncepciyi-rozvitku-cifrovoyi-ekonomiki-ta-suspilstva-ukrayini-na-20182020-roki-ta-zatverdzhennya-planu-zahodiv-shodo-yiyi-realizaciyi](http://www.kmu.gov.ua/npas/pro-shvalennya-koncepciyi-rozvitku-cifrovoyi-ekonomiki-ta-suspilstva-ukrayini-na-20182020-roki-ta-zatverdzhennya-planu-zahodiv-shodo-yiyi-realizaciyi).

<sup>892</sup> <https://mon.gov.ua/ua/news/uryad-spryamuvav-1-mlrd-grn-na-internetizaciyu-ta-kompyuterizaciyu-ukrayinskih-shkil-liliya-grinevich>.

<sup>893</sup> <https://mon.gov.ua/ua/news/uryad-spryamuvav-1-mlrd-grn-na-internetizaciyu-ta-kompyuterizaciyu-ukrayinskih-shkil-liliya-grinevich>.

<sup>894</sup> <https://mon.gov.ua/ua/news/uryad-spryamuvav-1-mlrd-grn-na-internetizaciyu-ta-kompyuterizaciyu-ukrayinskih-shkil-liliya-grinevich>.

Funds allocated for purchase of school computers based on:

- The share of students in secondary education who do not have computers;
- The share of secondary schools in which the ratio of students to PCs exceeds 10:1.

Funds to purchase Internet access allocated to local budgets:

- In proportion to the number of institutions that do not have access to the Internet;
- In proportion to the number of primary, lower secondary and upper secondary institutions and schools that have 100 or more students and Internet access speeds of less than 100 Mbit/s;
- In proportion to the number of other schools that have Internet access speeds of less than 30 Mbit/s.

The purchase of computers will be carried out on a co-financing basis, meaning that local governments will have to pay a certain share of the costs of equipment. The following ratios apply:

- For cities of regional significance: no more than 70 per cent of funds from government subsidy and no less than 30 per cent from local budgets;
- For districts: no more than 90 per cent from subsidy and no less than 10 per cent from local budgets;
- For villages (settlements) that have the status of mountain settlements or are on the “contact line”: no more than 95 per cent from subsidy and no less than 5 per cent from local budgets.

### 3.9.4 National responses to COVID-19 and educational initiatives for distance learning

On 12 March 2020, the Ukrainian Government imposed a three-week nationwide quarantine and shut down all educational institutions in the country. The Government also launched a centralized website containing all relevant information on the changes in the educational process implemented during the quarantine period. In particular, this platform provides information on distance learning, school completion, and current year exams, among other things. Moreover, it contains key information for teachers and questions and answers for families and students.

It must be noted that, before COVID-19 was declared a pandemic by the World Health Organization, the Ministry of Digital Transformation had already launched a national digital literacy programme called Diia: Digital Education<sup>895</sup> in January 2020.<sup>896</sup> This platform was created in the form of “edutainment” where free series are combined with experts and celebrities to explain how to use websites, the possible applications of smartphones and laptops, basic Internet safety rules and use of online services, along with courses on how to find jobs and how to acquire new skills to combat rising unemployment. The courses were developed by the EdEra Online Education Studio with support from Google, Microsoft, the DTEK Academy, UNDP, the e-Governance for Accountability and Participation programme, Cisco, the Ukrainian NGO Osvitoria and the Global Teacher Prize.<sup>897</sup>

<sup>895</sup> <https://osvita.diia.gov.ua/>.

<sup>896</sup> [www.kmu.gov.ua/en/news/oleksij-goncharuk-nacionalna-osvitnya-platforma-z-cifrovoyi-gramotnosti-diya-cifrova-osvita-startuye-vzhe-21-sichnya/](http://www.kmu.gov.ua/en/news/oleksij-goncharuk-nacionalna-osvitnya-platforma-z-cifrovoyi-gramotnosti-diya-cifrova-osvita-startuye-vzhe-21-sichnya/).

<sup>897</sup> [www.kmu.gov.ua/en/news/oleksij-goncharuk-nacionalna-osvitnya-platforma-z-cifrovoyi-gramotnosti-diya-cifrova-osvita-startuye-vzhe-21-sichnya/](http://www.kmu.gov.ua/en/news/oleksij-goncharuk-nacionalna-osvitnya-platforma-z-cifrovoyi-gramotnosti-diya-cifrova-osvita-startuye-vzhe-21-sichnya/).



In April 2020, the Government launched the Ukrainian Online School Initiative for pupils in grades 5 to 11. The project's main goal is to provide hybrid television-and-Internet educational content to all students facing the challenges imposed by COVID-19. This project was launched in the context of a partnership involving the Office of the President of Ukraine, the Ministry of Education and Science, the Ukraine Committee on Education, Science and Innovation, Osvitoria and UNICEF, which provided support for the development of lessons for grades 1 through 4 and partnered with private media for sign language translation of more than 500 lessons for all grades.<sup>898</sup> In the early stages of the project, a team of 80 teachers from Kyiv and the surrounding area came together to plan and prepare these hybrid lessons. The opportunity to join the broadcast of video lessons is open to all Ukrainian television channels.<sup>899</sup>

Overall, classes covered 14 different subjects, ranging from Ukrainian language and literature to world history, Ukrainian history, art and science. These classes catered for students at every stage of the Ukrainian education system, from year 1 to year 11. Lessons were posted on the Ministry's YouTube channel<sup>900</sup> and broadcast every morning on Ukrainian television and through partnerships with several Ukrainian channels that agreed to dedicate two hours per day to educational programming. During the first two months, the project attracted hundreds of thousands of subscribers from across Ukraine. It has produced more than 1 700 lessons for schoolchildren of all ages.<sup>901</sup>

In December 2020, the Ministry of Education and Science jointly with the Ministry of Digital Transformation and Ukrainian Institute of Education Development launched the online platform "All-Ukrainian School Online" for students of 5th-11th grades to provide equal access to education. The vision of All-Ukrainian School Online is to create the unique opportunities within the country and beyond to provide effective support to students and teachers dealing the challenges of digital world. The platform is an effective instrument for organization of blended and distance education for students in Ukraine and beyond (including children living in Non-Government Controlled Areas). Distance courses are aimed to support different forms of education - offline (day and evening forms), distance, and networking, individual for students of the 5th and 11th grades.

Online platform "All-Ukrainian School Online" is an educational resource, which provides equal access to education for all children, including children from vulnerable groups (children with disabilities, children from internally displaced families, children who are in difficult situations and others).

UNICEF is providing support to create additional functions - namely, sound descriptions of the lessons, which will increase their accessibility for the students with visual impairments (it is planned to provide sound descriptions for 1000 lessons by September 2021). Also UNICEF co-facilitated trainings on inclusiveness for content developers, provided on-going support.<sup>902</sup> Other direction of UNICEF's support is expanding the target audience of the online platform All-Ukrainian School Online 2.0 for students of primary classrooms, in particular online resources focused on literacy development. During 2021-2022 2800 online lessons for primary school

<sup>898</sup> [www.unicef.org/media/79691/file/ECARO-COVID19-SitRep-5-May-2020.pdf](https://www.unicef.org/media/79691/file/ECARO-COVID19-SitRep-5-May-2020.pdf).

<sup>899</sup> [www.kmu.gov.ua/en/news/6-kvitnya-na-youtube-kanali-mon-ta-shche-na-14-telekanalah-ta-mediaresursah-startuvala-vseukrayinska-shkola-onlajn](https://www.kmu.gov.ua/en/news/6-kvitnya-na-youtube-kanali-mon-ta-shche-na-14-telekanalah-ta-mediaresursah-startuvala-vseukrayinska-shkola-onlajn).

<sup>900</sup> [www.youtube.com/channel/UCQR9sMWcZshAwYX-EYH0qiA](https://www.youtube.com/channel/UCQR9sMWcZshAwYX-EYH0qiA).

<sup>901</sup> [www.atlanticcouncil.org/blogs/ukrainealert/ukrainian-educators-find-multimedia-solution-to-coronavirus-school-closures/](https://www.atlanticcouncil.org/blogs/ukrainealert/ukrainian-educators-find-multimedia-solution-to-coronavirus-school-closures/).

<sup>902</sup> See: <https://www.unicef.org/media/79691/file/ECARO-COVID19-SitRep-5-May-2020.pdf>.

students are expected to be created on the platform. These online resources will include Inclusion UKR type, which was created by UNICEF for children and adults with dyslexia. In addition to the online resources, the Concept of creating online resources for children of primary school age is planned to be developed this year.

To ensure that young children are supported with high-quality learning and development activities, UNICEF worked with the Ministry of Education and Science in 2020 to conduct the Learning at Home digital campaign, aimed at developing pre-school children's skills and competencies. The campaign included videos for parents on how to talk to children about COVID-19 and how to organize a day with children during quarantine and three webinars for pre-school teachers on development activities and how to organize distance learning, and reached approximately 5 million people across Ukraine.<sup>903</sup> In November 2020, UNICEF and the Ministry of Education and Science launched the comprehensive NUMO ("Go ahead") campaign, which focuses on learning and development for children in pre-schools and at home and provides a platform and tools for caregivers to support children when pre-school services are unavailable. It is implemented through NUMO!bot, a chatbot with over 4 000 downloads, and online platforms with 45 000 monthly users as of 2020 and promoted via communication channels.

In May 2020, UNICEF and the NGO Smart Education, with support from the Ministry of Education and Science, developed and launched distanced biology lessons on coronavirus infection.<sup>904</sup> In mid-August 2020, UNICEF and the Ministry launched a communication campaign on high-quality pre-school education to help parents and pre-school teachers increase their awareness of quality and facilitate developing children's competencies at home, particularly during the COVID-19 pandemic. The campaign was rolled out on television, social media, an online platform and outside billboards, targeting areas where access to pre-school education is the most challenging, including conflict-affected areas.<sup>905</sup>

A technical document containing all the details for distance learning was launched in September 2020<sup>906</sup> and came into force in October 2020. The regulations stipulate that the interests of students must be taken into account during distance learning:<sup>907</sup>

- The organization of the educational process should ensure regular and meaningful interaction between teachers and students;
- During distance learning, conditions should be created to ensure full participation in the educational process by persons with special educational needs, and individual development programmes must be taken into consideration;
- The educational institution should ensure regular monitoring of students' learning outcomes and the need to provide them with support in the educational process;
- For students who cannot participate in live distance learning for valid reasons, the institution should make other means of communication available to students, such as telephone or mail;
- The organization of the educational process must be carried out in compliance with personal data protection requirements, as well as sanitary rules and regulations on

<sup>903</sup> [www.unicef.org/media/79706/file/ECARO-COVID19-SitRep-14-April-2020.pdf](http://www.unicef.org/media/79706/file/ECARO-COVID19-SitRep-14-April-2020.pdf).

<sup>904</sup> [www.covid19healthsystem.org/countries/ukraine/livinghit.aspx?Section=6.1%20Measures%20in%20other%20sectors&Type=Section](http://www.covid19healthsystem.org/countries/ukraine/livinghit.aspx?Section=6.1%20Measures%20in%20other%20sectors&Type=Section).

<sup>905</sup> [www.unicef.org/media/84846/file/Ukraine-SitRep-30-September-2020.pdf](http://www.unicef.org/media/84846/file/Ukraine-SitRep-30-September-2020.pdf).

<sup>906</sup> <https://mon.gov.ua/ua/npa/deyaki-pitannya-organizaciyi-distancijnogo-navchannya-zareyestrovano-v-ministerstvi-yusticiyi-ukrayini-94735224-vid-28-veresnya-2020-roku>.

<sup>907</sup> <https://mon.gov.ua/ua/news/vidsogodni-nabuvayut-chinnosti-onovleni-umovi-distancijnogo-navchannya-u-shkolah>.

arrangements for training sessions, eye and posture exercises, the continuous duration of educational activities using ICTs, time for homework, and so on.

To address gaps in access to digital learning solutions among children and teachers, UNICEF has supported 20 schools in eastern Ukraine with dedicated IT equipment, including laptop computers, printers and tablets. The aim is to enable digital devices to be lent to children who are learning from home but lack the devices necessary to participate in digital learning. An estimated 800 children have benefited from this support. Moreover, UNICEF has responded to the Government's request for support on the National Online School 2.0 project. Co-led by the Ministry of Digital Transformation and the Ministry of Education and Science, the project aims to develop a fully functioning learning platform with particular attention to the most marginalized children. To improve the platform's accessibility for all children, including for children with special educational needs, UNICEF co-facilitated trainings on inclusiveness for content developers, has provided on-going support, and is engaging with partner organizations from civil society and the private sector to create additional features, including sign language translation and soundtracks for learners with visual impairments.<sup>908</sup>

In furthering efforts to reach the most marginalized, the Ministry of Education and Science is also implementing a joint programme with UNICEF to improve the quality of education for children with special educational needs. Selected schools will be provided with textbooks and other paper and digital materials designed for children with disabilities such as dyslexia. A separate partnership agreement was also made with the authors and publishers of certain primary school textbooks to use the Inclusion UKR font, designed by UNICEF Ukraine in partnership with the NGO Social Synergy to be convenient for a range of readers, including those with dyslexia. In partnership with Learning Passport, a series of gamified html animations are also being created to support early learners who have learning difficulties related to dyslexia.<sup>909</sup>

UNICEF and the Institute of Educational Analytics, under the Ministry of Education and Science, conducted a national survey to better understand the readiness of schools, communities and the general education system to resume education under pandemic conditions.<sup>910</sup> The Government also launched a document with recommendations from the Ministry of Education and Science on strategies to create safe conditions at general secondary education institutions throughout the country to prepare for the 2020-2021 academic year.<sup>911</sup> Moreover, changes have also been made to the state budget to address socio-economic challenges related to COVID-19. To help fund this new expenditure, the Cabinet of Ministers submitted a bill to amending the state budget and instructing the Government to cut subsidies, regional budgets, sporting programmes, and expenditure on elections and the census, as well as financial assistance dedicated primarily to schools and teachers.<sup>912</sup>

Later, the Government permitted kindergartens to reopen as long as they met the required epidemiological criteria. In September 2020, schools across Ukraine reopened for in-person classes, except for schools in "red zone" areas where infection rates were highest. All children in fifth grade and above are required to wear masks around schools. In October, the Government announced that universities and other institutions of higher education would switch to distance

<sup>908</sup> [www.unicef.org/media/79691/file/ECARO-COVID19-SitRep-5-May-2020.pdf](http://www.unicef.org/media/79691/file/ECARO-COVID19-SitRep-5-May-2020.pdf).

<sup>909</sup> UNICEF Europe and Central Asia Region COVID-19 response questionnaire, September 2020.

<sup>910</sup> <https://reliefweb.int/report/ukraine/unicef-flash-report-covid-19-impact-children-ukraine-august-3-2020>.

<sup>911</sup> <https://mon.gov.ua/ua/npa/shodo-organizaciyi-roboti-zakladiv-zagalnoyi-serednoyi-osviti-u-20202021-navchalnomu-roci>.

<sup>912</sup> <https://www.oecd.org/eurasia/competitiveness-programme/eastern-partners/COVID-19-CRISIS-IN-UKRAINE.pdf>.

learning owing to COVID-19.<sup>913</sup> In November, the Ukrainian Government restricted attendance at educational institutions to no more than 20 people, except for pre-school, school and after-school activities. Institutions operating at these three levels of education must operate at a maximum of 50 per cent attendance capacity.<sup>914</sup>

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<sup>913</sup> [www.hrpub.org/download/20200730/UJER46-19591379.pdf](http://www.hrpub.org/download/20200730/UJER46-19591379.pdf).

<sup>914</sup> <https://www.oecd.org/eurasia/competitiveness-programme/eastern-partners/COVID-19-CRISIS-IN-UKRAINE.pdf>.

## 4 Conclusions

Over the past decade, the intersection of the policy areas of education and telecommunications has become more evident, consistent with a wider trend towards the “digitalization of everything”, whereby more and more sectors digitalize and digital becomes a horizontal policy consideration.

As highlighted in the introduction and throughout the country profiles, this integration between education and digital has evolved in three main directions:

- ICTs for digital skills in education, as an integral part of education curricula to create a workforce fit for the job market;
- ICTs for e-governance of education, as a tool for public administration; and
- ICTs to support education delivery, to ensure continuity of digital services when in-person learning is disrupted and to enhance in-person learning with blended models.

These intersections are favoured by policies which foster connectivity infrastructure and the proliferation of devices in schools, primarily, and households, especially as a result of the COVID-19 pandemic. School connectivity is, therefore, widely recognized as a means of achieving more efficient administration of educational systems, a more innovative way of distributing education content, and, most importantly, a fundamental prerequisite to endow pupils with the digital skills necessary to thrive in the job market.

Connectivity in education, however, is a far more multidimensional reality affecting many other facets of education provision and the digital world than those implied by the primary objectives delineated above. For example, the core issue of providing ICT infrastructure in schools is intimately intertwined with and brings forward additional policy areas for discussion, such as child online protection, teacher training to use digital tools, financing partnerships, and capacity building. Leveraging digital technologies to enhance digital skills among students, maintain education delivery and facilitate the administration of education systems cannot occur in a vacuum, without consideration for the protection of children online, the upskilling for teachers that must accompany any digital transformation, and other dimensions without which any intervention will not achieve the maximum positive impact. In addition, further research must be undertaken on connectivity in education—beyond the dichotomy of school connectivity and out-of-school children—by highlighting practices that use digital tools to continue and enhance learning for children, adolescents and young people outside the context of any educational institution.

In order to capture these multidimensional realities, a comprehensive review of the challenges faced by each country at the intersection of connectivity and education was conducted on the basis of the information presented in Chapter 3 of this report. The outcome of the review—a **Catalogue of Challenges** common to many of the nine countries examined in the report—is outlined in Table 8. Such challenges are presented in no particular order of importance or prevalence but serve as a summary of the obstacles faced by these nine countries and their education systems.

Table 8 - Catalogue of challenges

<b>High education personnel costs</b> can crowd out investment in learning materials, equipment and training.
Unequal access to digital tools and connectivity limits the <b>ability of digital technology to accelerate learning outcomes</b> , such as improving proficiency in foundational skills
Unequal access to devices and connectivity exacerbates existing <b>disparities in education access and outcomes</b> across vulnerable groups.
In schools, there are <b>low ratios of PCs per student</b> relative to OECD peers.
In schools, <b>PCs are sometimes out of commission</b> , outdated, and not connected to an Internet speed adequate for online learning.
In schools, <b>PCs are concentrated in one laboratory</b> rather than covering all classrooms.
<b>Lacking access to devices and connectivity in students' households</b> can prohibit effective distance teaching and learning.
<b>Lacking access to devices and connectivity in teachers' households</b> can prohibit effective distance teaching and learning.
<b>Lacking broadband strategies based on assessments and concrete needs</b> can prohibit effective deployment and identification of schools in need of investment.
<b>Lacking geo-referenced, central broadband mapping systems</b> can prohibit effective deployment and identification of schools in need of investment.
<b>Poor, limited, or non-existent harmonization in education data collection system (EMIS)</b> hinders efficient management and administration.
<b>Inadequate oversight mechanisms</b> in decentralized school systems complicates the identification of issues and the provision of support.
Strategic education documents sometimes <b>lack monitoring and evaluation systems with an equity focus</b> , or action plans and objectives.
<b>Insufficient ICT training for teachers</b> impedes digitalization of education and quality, inclusive distance education delivery.
<b>Digital skills are lacking</b> amongst student populations. This prevents from benefitting optimally from EdTech-supported learning and contributes to low availability of digital skills in the job market.
Substantial and coherent <b>links between digital reform and other key educational reforms</b> , namely curricula reforms, remain <b>undefined</b>

This report has presented not only a snapshot of the challenges faced by countries in the European region in the field of connectivity and education, but also some key actions taken by governments in order to address these challenges and fill gaps in terms of devices, connectivity and funding.

A similar review was conducted to identify key country experiences in this respect, with the results presented in Table 9. The list below is a **Catalogue of Country Experiences**—actions taken by countries within a specific context related to the topics of this report—and by no means does it constitute a qualitative assessment on the extent to which these actions were successful

in achieving their respective aims. Nor does this list of country actions serve as a normative invitation to emulate these actions to achieve certain goals; rather, it stands as a repository of relevant country experiences in addressing connectivity in education, serving as a descriptive summary of what has been outlined in this report.

**Table 9 - Catalogue of country experiences**

<p><b>Broadband infrastructure mapping systems</b> can provide transparent information on broadband to markets and consumers and support infrastructure sharing so as to more efficiently allocate public funding for school infrastructure development.</p>
<p>Explicitly <b>referencing ICTs, digital skills and school connectivity in strategic documents</b> governing education can better focus priorities for long-term policy.</p>
<p><b>Education management information systems (EMISs)</b> can modernize the collection, management and use of data for better administration of the education system.</p>
<p>Leveraging <b>partnerships with international financial institutions</b> can provide schools with better connectivity and device access.</p>
<p>Explicitly <b>referencing school connectivity in national strategic documents</b> governing broadband deployment strategies can better focus priorities for long-term policy.</p>
<p>Leveraging <b>partnerships with mobile network operators, Internet service providers and other private-sector partners</b> can provide project financing to decrease digital learning gaps.</p>
<p>Leveraging <b>partnerships with international organizations</b> can help implement projects to provide connectivity and devices and to develop digital skills programming in schools as a fundamental part of curricula.</p>
<p>Issuing educational content and creating platforms <b>adapted to local minority languages</b> can increase access and use among linguistic-minority children, who are at greater risk of exclusion from distanced learning.</p>
<p>Forging <b>partnerships with civil society organizations and NGOs</b> can help fill gaps in connectivity and device availability to decrease the digital divide in education.</p>
<p><b>Television broadcasting</b>, a solution to fill education gaps during the COVID-19 pandemic, can be continued post-pandemic to reinforce learning in the home and bridge learning gaps using ICTs.</p>
<p>Establishing <b>donation campaigns based on transparent data and gaps assessments</b> can connect potential donors of ICT equipment with schools in need.</p>
<p><b>Public-private partnerships</b> can provide innovating financing mechanisms for better connectivity and device provision by tapping into international organizations, civil society organizations and international financial institutions.</p>
<p>Transparently and comprehensively <b>collecting data on digital skills</b> levels among students, teachers and parents can help better assess gaps and thus target interventions.</p>
<p>Enacting <b>digital skills training for teachers</b> can help teachers better adapt to distance learning and foster ICT literacy among students.</p>
<p>Developing <b>geographical information systems specifically dedicated to mapping school infrastructure</b> can prove key for planning, establishing, monitoring and supervising schools and for developing modern, environmentally friendly and original infrastructure.</p>

Table 9 – Catalogue of country experiences (continued)

Even where curricula are not integrated with full programming on digital skills, <b>embedding digital competencies into other subjects</b> can increase ICT literacy among students.
<b>Tapping into state budgets</b> to make large investments in connectivity can help close digital gaps between schools and between students.
<b>Collaborations between various government ministries</b> can help mobilize project financing to provide connectivity to schools.
<b>Government-launched centralized websites</b> can provide support to students, teachers and parents to ensure the continuity of learning during the COVID-19 crisis. Specific strategies to address the crisis have taken three major forms: broadcasting, creating repositories of educational content, and making tools available for online communication.
<b>One-stop online locations</b> created by governments in response to the need for distance learning arising from COVID-19 can facilitate student, teacher and parent access to various online learning platforms managed by the government, NGOs and the private sector.

This report has highlighted, on many occasions, the lack of comprehensive and holistic data available on the subject of connectivity in education—notably on the availability and number of devices, device connectivity to the Internet, and achievement levels of students in digital skills. These gaps in data have a real-world effect far beyond the pages of this report. Gaps in data translate into gaps in research, and therefore evidence. Without firm, reliable evidence about the state of device ownership, the quality of connectivity in schools and the level of digital skills among students, needs assessments are difficult to conduct—and without exhaustive needs assessments, international donors and financing partners may be hesitant to fund systematic initiatives on a large scale, precluding assistance from reaching the children in Europe who may need it most.

In capturing a descriptive snapshot of the status of connectivity in education, this report has aimed to serve as a first step in addressing some of the challenges outlined above. As a comprehensive repository of data, evidence and policies, this report may form the basis for carrying out a comparative policy analysis and elaborating a set of policy recommendations or best practices, in consultation with stakeholders. While distance education will never replace in-class learning, ICTs are becoming increasingly integral to the learning process; understanding the current status of digital tools in education is therefore a vital first step in ensuring that the digital transformation is harnessed to improve equity, education quality, inclusion and learning, which lay the foundations for sustainable development.



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