Connectivity in Education

Status and Recent Developments in 9 non-EU Countries

Introducing the Report

School connectivity plays an essential role in strengthening education systems to be resilient to shock 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 a wide range of quality content for learning that is both relevant and personalized. It can **support inclusion** by enabling the use of assistive and adaptive technologies. Connectivity can improve the collection and use of data and the integration of education management information systems for better administration of the scholastic system, from the central to the local government and the school itself. And it can **drive innovative, local solutions** for connecting all young people to the internet and to quality learning and skills development. However, such a vision **requires adequate infrastructure** at the school and country level, including access to appropriate ICT devices and reliable connection to the Internet.

Our Mission

Provide an accurate picture of the situation in each country, equip national stakeholders with information to address gaps, and ensure that education plays a key role in driving the digital transformation, and vice versa.

Introducing this Info Brief

This document is intended to serve as a **visual executive summary** highlighting the key findings of the Connectivity in Education report. This visual accompaniment explores regional trends in education development, device availability and connectivity indicators in South-Eastern Europe, and a more in-depth investigation of country situations can be found in the report.

Our Scope

- Albania
- Bosnia and Herzegovina
- Georgia
- Moldova
- Montenegro
- North Macedonia
- Serbia
- Turkey
- Ukraine

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Spotlight on Education

In the region, there exists a crisis of learning in education. This is exemplified by out-of-school rates in the country, as well as those not achieving minimum proficiency. As ICTs are a crucial enabler of the learning process, unequal pre-existing infrastructure in households and schools – one of the contributing factors to the digital divide - is one major driver of the longer-term crisis of learning. The most revelatory trends in education in the region, including positive developments regarding the length of compulsory education, are outlined on this page.

Length of Compulsory Education

from **< 7 years** of compulsory education required 20 years ago to

Country	Years [1]
Albania	9
Bosnia and Herzegovina	9
Georgia	9
Moldova	11
Montenegro	9
North Macedonia	13
Serbia	8
Turkey	12
Ukraine	11

More time in school does not necessarily translate to improved learning outcomes.

Of the 25 million pupils ages 6 and 17 enrolled in school in the 9 countries, close to **9.8 million** children and adolescents are **not achieving minimum proficiency** in the foundational skills needed for further learning.[2]

And not all school-aged children are enrolled.

Proportion of Out-of-Learning Children ages 6-17 per Country[3]

Albania 31,277

Bosnia and Herzegovina 66,824

Georgia 9,355

Moldova 70,875

Montenegro 5,918

North Macedonia 11,528

Serbia 45,473

Turkey 1,521,931

Ukraine 258,676

Enrolled, achieving minimum proficiency

Enrolled, not achieving minimum proficiency

Out of School

2,021,857

Total children OOS in the the region[3]

Increasing Importance of ICTs for Education

School connectivity is widely recognized as a means to a 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. This necessitates devices and access to stable Internet connection, which are explored on the following two pages.

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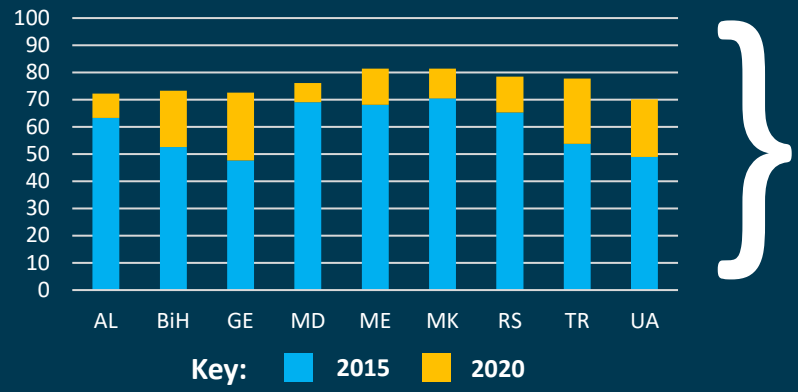
Spotlight on Connectivity[4]

Percent of the Population....

Using the Internet



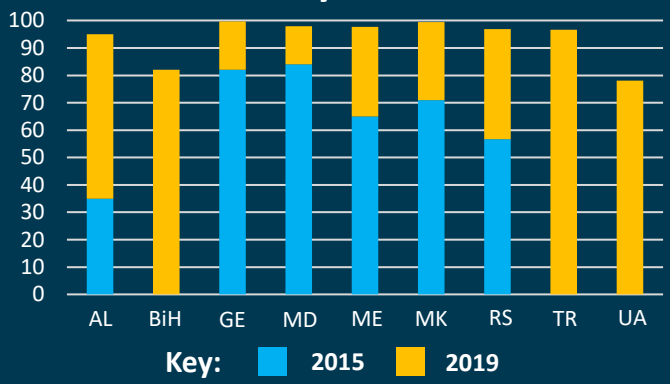
37.3 million

individuals do not make use of the Internet, representing 30% of the total population of the 9 countries.

34.6 million

have been brought online since 2015.

Covered by 4G/LTE



10% → 91.4%

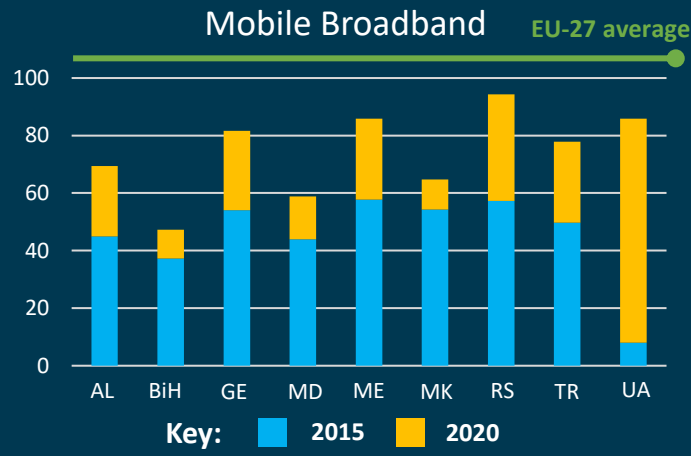
of the population covered by 4G/LTE technology in 2015 versus 2019.

123 million

have been brought to 4G/LTE speeds since 2015.

Broadband Subscriptions Per 100 Inhabitants

Mobile Broadband

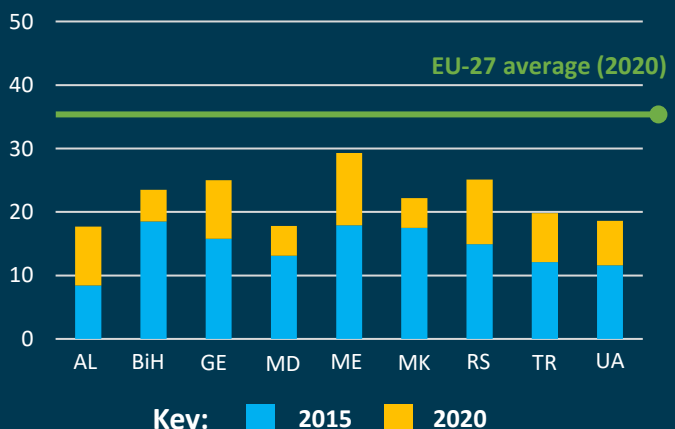


>55 million

Active mobile broadband subscriptions

1 in 3 people subscribe to mobile broadband

Fixed Broadband



37.7% of fixed broadband subscriptions are **fibre** (vs 18.4% in EU countries).

Is mobile the solution?

Devices such as smartphones and tablets **have lower fixed costs**, require very **limited digital skills**, and allow for **greater geographic mobility.** *But* they may require higher levels of digital skills when used for learning, and the efficacy of smartphones for delivering quality education and engaging in digital learning over long periods of time is disputed.

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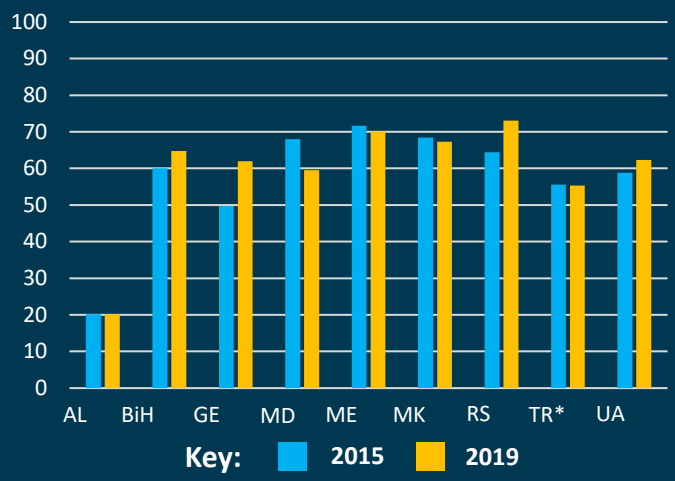
Infrastructure in schools is vital. However, gaps in access to digital education can also be exacerbated by unequal access to Internet connection and suitable devices in the home, especially when they affect marginalized children, including children with disabilities, Roma and other ethnic and linguistic minorities, girls, and those from the poorest household. This section explores household connectivity data as another crucial facet of connectivity in education.

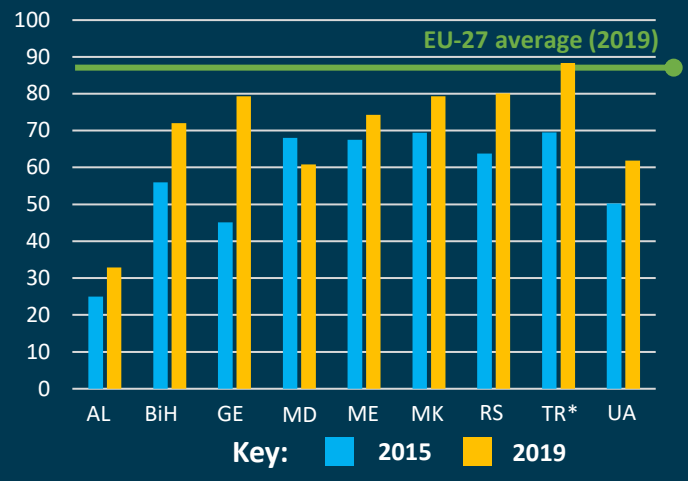
Estimated Percentage of Households with…

A PC at Home



*data for 2020

Internet Access at Home



Taking a Closer look into the Gaps, we find…

18 million

Households are not in possession of a PC

11 million

Households do not have access to the Internet

Exacerbating pre-existing inequalities:

The persistent lack of PCs in households is particularly significant in times during which lockdowns triggered by the COVID-19 pandemic facilitated the transition of economic activity to the digital sphere and transferred both educational and work activities to the household. Importantly, this left the most marginalized learners behind, sometimes without any access to learning

36 million

school-age children, (3 to 17 years old) **without internet access at home** in Eastern Europe and Central Asia[5]

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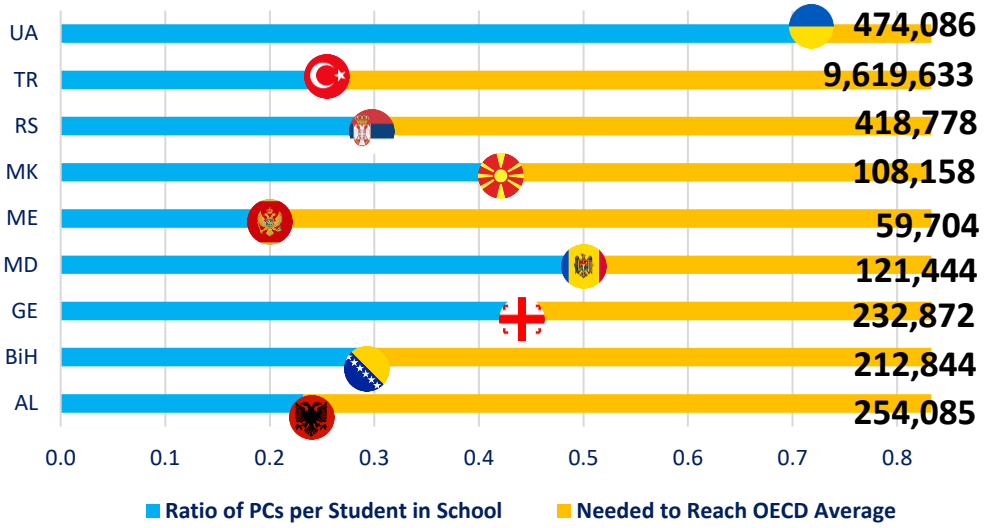
Addressing Challenges

Filling the Device Gap in Schools

Computers per Student needed in School[6]



11,501,604
Total estimated computers needed in the region to reach OECD average (0.83 PCs per student)

The Total Cost of Filling the Device Gap in Schools

Low-Range Estimate[7]

$846.5 million

to reach the OECD average of 0.83 PCs per student.

High-Range Estimate[8]

$9.77 billion

to reach the OECD average of 0.83 PCs per student.

Partnerships Filling the Gaps

Ministries of Education have often been excluded from the decision-making table, precluding sustainable investment in ICTs for education which could otherwise be supported by tapping into national budgets. They have also not yet capitalized on innovative funding mechanisms on a large scale to ensure connectivity in education.

- **International organisations and IFIs have been active in closing the gap by facilitating partnerships with governments and the private sector and providing technical assistance or funding.**
- **These have aimed to decrease the costs of and improve access to household connectivity and devices. They have also focused on procuring connectivity contracts in public administrations.**

Projects and Partners

f@tih
educare georgia
give internet .org
learning passport
GRENA
SEAF
Smart Education
AED Ideas Changing Lives
Western Balkans Investment Framework WBIF
BUILDING THE EUROPEAN FUTURE TOGETHER
European Investment Bank
European Bank for Reconstruction and Development

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One major challenge faced by the education system is the COVID-19 pandemic. It also placed in stark relief the importance of ICTs for education and laid bare the inequalities that can be exacerbated by the digital divide. In the region, 23 million primary and secondary school children were impacted by school closures. This sub-section presents some benefits and challenges of practices in responding to such crises. It is intended to spur discussion among stakeholders on the benefits of ICTs for the maintenance of education delivery in times of crisis.

COVID-19: Strategies for Distance Learning

Television Broadcasting to transmit lessons

PROS:
- Low-technology
- No internet access required
- Limited digital skills required
- Broad reach, regardless of geographic location

CONS:
- Ideally supported by parents or caregivers
- Limited interaction between teachers and learners

Creation/Strengthening of national online distance learning platforms

PROS:
- More interaction between teachers and learners

CONS:
- Varied rates of participation between and within countries
- Access to connectivity and appropriate devices, limited financial resources, and digital divide disproportionately exclude rural children, poor children, Roma and other ethnic and linguistic minorities, children with disabilities and girls.

Organisation of online classes replicating the physical classroom

PROS:
- More active engagement
- Greater teacher-student interaction in real-time

CONS:
- Logistically difficult to organize
- Requires access to and the ability to use appropriate devices connected to the internet for at least the duration of the lesson

Taking Stock

Challenges for Connecting Every Child

High education personnel costs can crowd out investment in learning materials, equipment and training.

Unequal access to digital tools and connectivity limits the **ability of digital technology to accelerate learning outcomes**, such as improving proficiency in foundational skills.

Unequal access to devices and connectivity exacerbates existing **disparities in education access and outcome**s across vulnerable groups.

In schools, there are **low ratios of PCs per student** relative to OECD peers.

In schools, **PCs are sometimes out of commission**, outdated, and not connected to an Internet speed adequate for online learning.

In schools, **PCs are concentrated in one laboratory** rather than covering all classrooms.

Lacking access to devices and connectivity in students' households can prohibit effective distance teaching and learning.

Lacking access to devices and connectivity in teachers' households can prohibit effective distance teaching and learning.

Lacking broadband strategies based on assessments and concrete needs can prohibit effective deployment and identification of schools in need of investment.

Lacking geo-referenced, central broadband mapping systems can prohibit effective deployment and identification of schools in need of investment.

Poor, limited, or non-existent harmonization in education data collection system (EMIS) hinders efficient management and administration.

Inadequate oversight mechanisms in decentralized school systems complicates the identification of issues and the provision of support.

Strategic education documents sometimes **lack monitoring and evaluation systems with an equity focus**, or action plans and objectives.

Insufficient ICT training for teachers impedes digitalization of education and quality, inclusive distance education delivery.

Digital skills are lacking 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 **links between digital reform and other key educational reforms**, namely curricula reforms, remain **undefined**.

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- Substantial and coherent **links between digital reform and other key educational reforms**, namely curricula reforms, remain **undefined**.

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Actions Taken to Connect Every Child

The grid below is a catalog of actions taken by countries within a specific context related to connectivity in education. 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 it serve as a normative invitation to emulate actions to achieve certain goals. Rather, it stands as a repository of relevant country experiences addressing connectivity in education, serving as a descriptive summary of what has been outlined in the report.

Broadband infrastructure mapping systems can provide transparent information on broadband to markets and consumers, as well as support infrastructure sharing, to more efficiently allocate public funding for school infrastructure development.

Explicitly **referencing ICTs, digital skills, and school connectivity in strategic government documents** on education can better focus priorities for long-term policy.

Education Management Information Systems (EMIS) can modernise the collection, management and use of data for better administration of the education system.

Leveraging **partnerships with IFIs** can provide better connectivity and device access to schools.

Explicitly **referencing school connectivity in national strategic documents** governing broadband deployment strategies can better focus priorities for long-term policy.

Leveraging **partnerships with MNOs, ISPs and other private sector partners** can provide project financing to decrease digital learning gaps.

Leveraging **partnerships with IOs** can help implement projects to provide connectivity and devices and to develop digital skills programming in schools as a fundamental part of curricula.

Issuing educational content and creating platforms **adapted to local minority languages** can increase access and use among linguistic-minority children who are at greater risk of exclusion from distanced learning.

Forging **partnerships with CSOs and NGOs** can help fill gaps in connectivity and devices to decrease the digital divide in education.

TV broadcasting, 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.

Establishing **donation campaigns based on transparent data and gaps assessments** can connect potential donors of ICT equipment with schools in need.

PPPs can provide innovating financing mechanisms for better connectivity and device provision by tapping into IOs, CSOs, and IFIs.

Transparently and **comprehensively collecting data on digital skills** levels among students, teachers and parents can help better assess gaps and thus target interventions.

Enacting digital skills training for teachers can help teachers better adapt to distance learning and foster ICT literacy among students.

Developing GIS information systems specifically dedicated to mapping school infrastructure can prove key for planning, producing, monitoring and supervising schools, as well as for developing modern, environmentally friendly and original infrastructure.

Even where curricula are not integrated with a full programming on digital skills, **embedding digital competencies into other subjects** can increase ICT literacy among students.

Tapping into state budgets to make large investments in connectivity can help close digital gaps between schools and between students.

Collaborations between various government ministries can help mobilize project financing to provide connectivity to schools.

Government-launched centralized websites 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, a repository of educational content, and making available tools for online communication.

One-stop online locations created by governments in response to COVID-19-necessitated distance learning can facilitate student, teacher, and parent access to various online learning platforms managed by the government, NGOs, and the private sector.

ITU and UNICEF are committed

to helping the Government of Albania and other stakeholders achieve national objectives through **technical assistance**, **capacity building** and **research**. School connectivity is widely recognized as a means to a 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. The achievement of appropriate device and connectivity levels, both at school and in the home, thus remain priorities of both the ITU Office for Europe and UNICEF Regional Office for Europe and Central Asia.

Both offices cherish the opportunity to be facilitators and brokers for peer-to-peer engagement on the issue.

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Endnotes

[1] Data from UNESCO UIS Database. http://data.uis.unesco.org. Data is from 2019 except Turkey (2018) and Ukraine (2014).
[2] UNICEF calculation of the number of students in primary, lower and upper secondary not achieving minimum proficiency in math; Data for Albania is calculated using the latest figures available from UIS and PISA.
[3] Data from UNESCO UIS Database. http://data.uis.unesco.org. Both the pie chart for North Macedonia, and the sum total of OOS children in the region, do not include OOS children and adolescents in North Macedonia, as data is not available.
[4] Data from ITU World Telecommunication/ ICT Indicators Database online (2020)
[5] ITU-UNICEF Publication on "How many Children and Young People have Internet Access at Home? Estimating digital connectivity during the COVID-19 pandemic" (https://www.itu.int/en/ITU-D/Statistics/Documents/publications/UNICEF/How-many-children-and-young-people-have-internet-access-at-home-2020_v2final.pdf)
[6] PISA 2018 Results (Volume V); OECD 2020 (Figure V.5.4 School computers per student, school characteristics and reading performance).
[7] This estimate is calculated using the cheapest smartphone available in the region, at $73.60 per device. Price estimate is taken from A4AI price data, averaging the cost of the cheapest smartphones available in Georgia, Turkey and Ukraine. Although Smartphones are used as a proxy for the cheapest way to access online educational content and represent a baseline cost, they are not ideal for sustained learning nor comparable to PCs for educational purposes.
[8] This estimate is calculated using using a price of **$850 per computer and monitor**, which is a UNICEF price estimation of a high-end computer and monitor more suitable for learning. It thus represents the most expensive end of the spectrum.