

# Digital diversity across Europe

Policy brief September 2021

## Introduction

The ongoing digital transformations today bring along the risk of new digital divides between those with access, skills and motivation to use new technologies and those without. The consequences may lead to new forms of social disadvantages and inequalities. For example, digital divides, including both the access divide, the imbalance of digital use and digital literacy, threaten the vision of a democratic space where everyone has an equal opportunity for participation. Consequently, excluded groups will be at risk of not reaping the full benefits of digital technologies.

ICT has become a fundamental part of education, cooperation, cognitive development, entertainment, and socialisation for children and young people in Europe. The COVID-19-pandemic has exacerbated these effects as many countries have moved all or some of their teaching online, leading to an increase in children and young people's online activity. Therefore, having access to a computer and an internet connection is essential for keeping up with their educational development, as well as staying connected with their family and friends.

Generally, the lack of access to ICT has been seen as a significant cause of social exclusion. Factors that explain digital divides are linked to geography, gender, disability, age and socio-economic status.

There is a growing public concern that children and young people are falling behind in their educational development, particularly those with fewer technological resources or unreliable internet access. This concern has been referred to in the literature as the "first-level" digital divide, which consists of a binary classification in terms of physical access to digital devices.

Moving beyond access, and despite the high levels of internet diffusion across countries, many students are still disproportionately equipped for their technology rich future. The result is that various kinds of digital divides still prevail in society and affect the young generation and their digital futures. These differences are considered as "second-level" digital divides. ICT interest and confidence play an essential role in the acquisition of digital skills, which are, in turn, fundamental to eradicate digital inequalities.

Drawing on evidence from the DigiGen project, this policy

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brief addresses the following crucial questions:

1. Who are the digitally deprived children and young people of Europe regarding the first and second level digital divide?
2. How can we improve the situation of such children and young people?

## Main findings

### The first-level digital divide: Digital deprivation

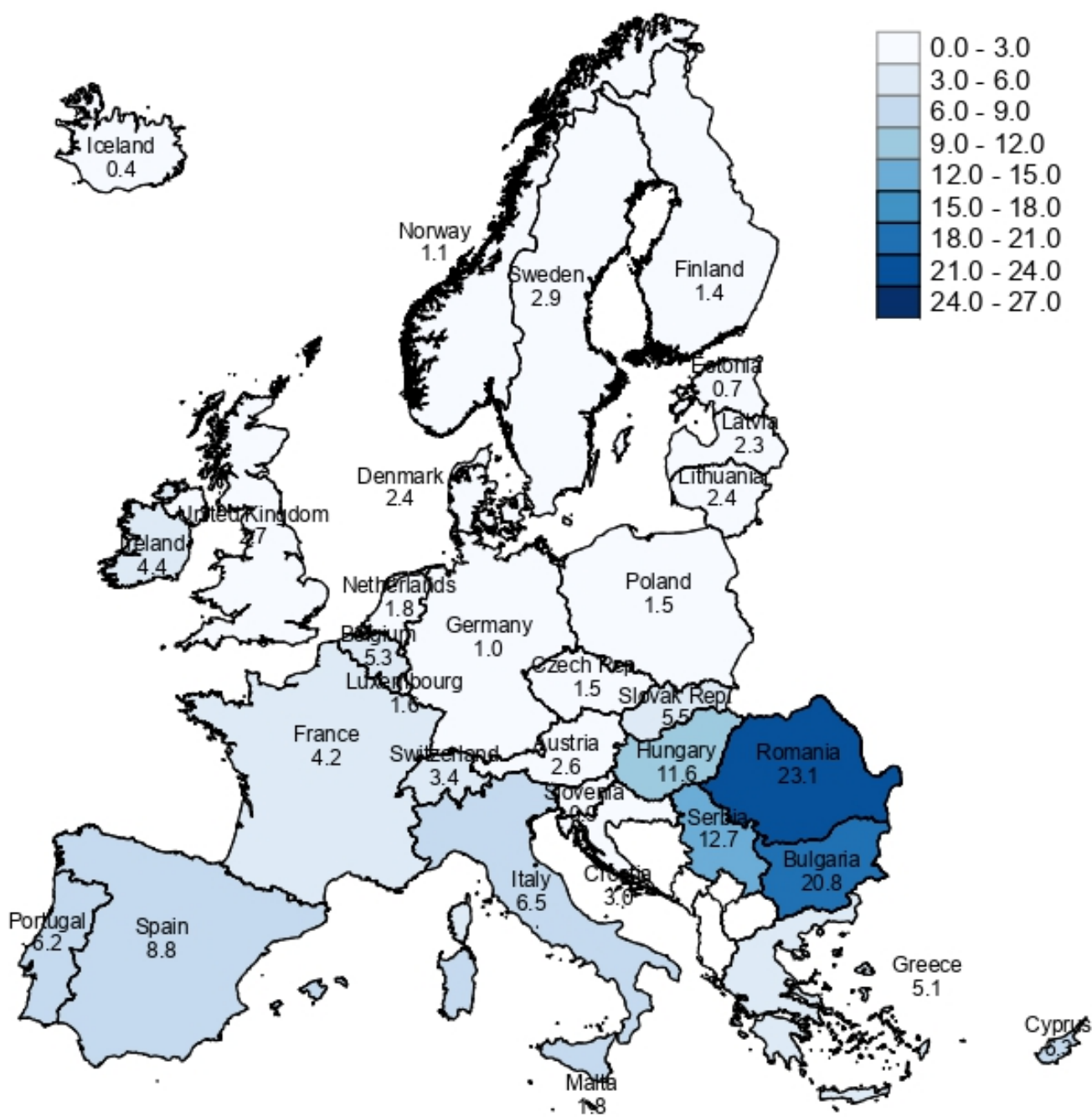
Using data from the European Union – Statistics on Income and Living Conditions (EU-SILC) for the latest wave of data available, DigiGen has explored the extent to which European children and young people may be digitally deprived. We define “digitally deprived” as those children and young people who either live in a household that cannot afford to have a computer and/or live with adults who cannot afford an internet connection, thus focusing on “enforced lack” due to lack of monetary resources.

On average, 5.3% of the children and young people in Europe are digitally deprived. However, differences across Europe regarding the prevalence of digital deprivation among school-aged children and young people are large, as shown by Figure 1. For example, 23.1% of children and young people are digitally deprived in Romania, while such percentage is only 0.4% in Iceland. Our analysis has identified two country clusters with a certain North-South divide.

As for the socio-economic characteristics that define “digitally deprived” children and young people, we have considered six vulnerable groups: children and young people (i) living in a lone parent household; (ii) living in a poor household; (iii) living in severe material deprivation; (iv) from immigrant origin; (v) living with low educated parents and (vi) living in a large family. One characteristic clearly stands out at the European level as being very closely linked to children’s digital deprivation: living in severe material deprivation. This increases the risk of suffering digital deprivation by a factor of 6.7. Being poor and having low-educated parents are also relevant factors — these variables multiply the risk of being digitally deprived by a factor of 2.9 and 3.3, respectively. However, the heterogeneity of characteristics that describe a digitally deprived child is considerable across country clusters (see Ayllón et al., 2021).



Figure 1: Percentage of digitally deprived school-aged children and young people (6-16), Europe, 2019



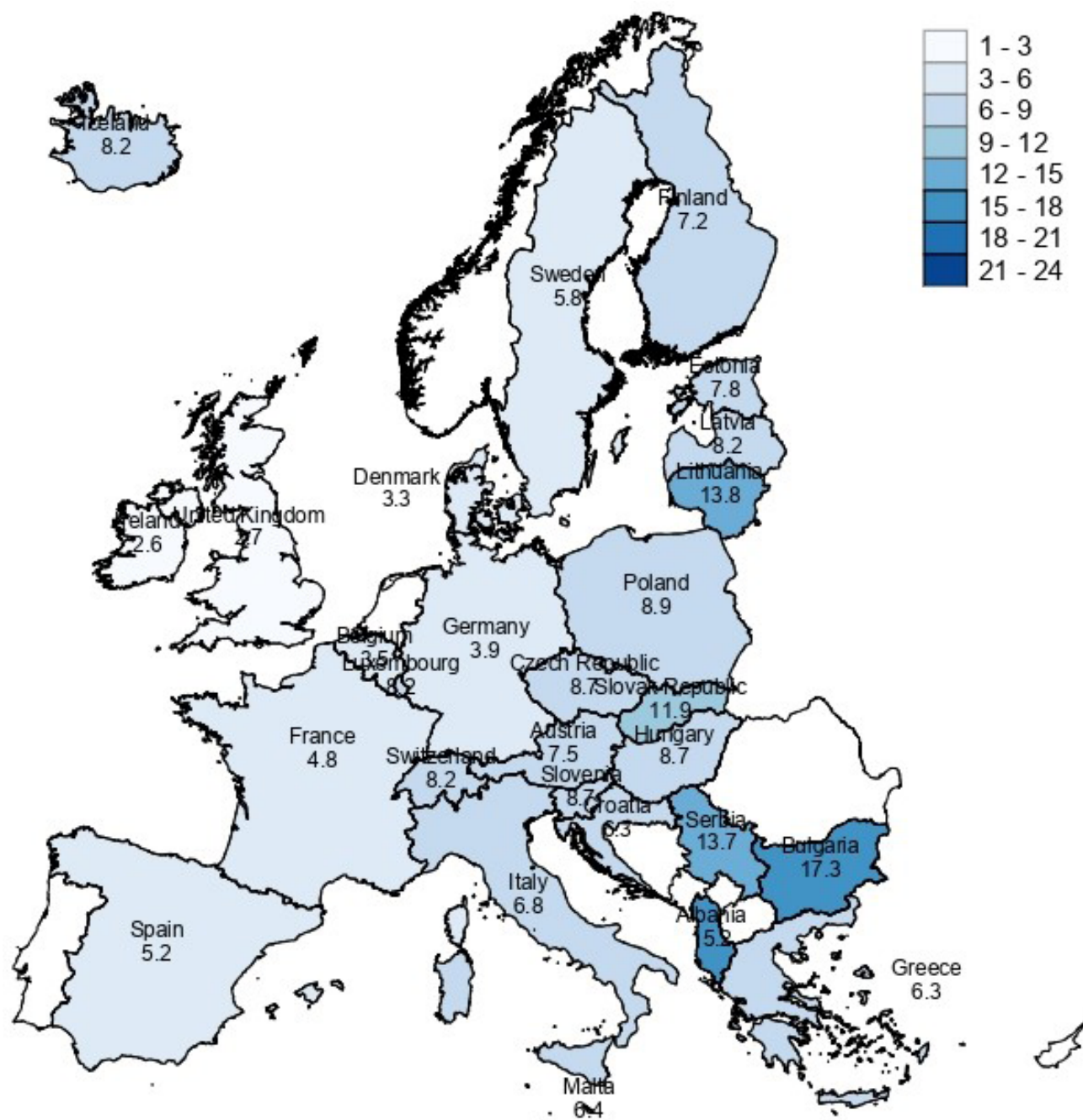
Source: Ayllón et al. (2021).

## The second-level digital divide: Digital disengagement and lack of confidence

Using data from the OECD's Programme for International Students Assessments (PISA) for 2018, DigiGen has explored digital inequalities along the second-level divide focusing on children and young people's digital disengagement and digital lack of confidence. Using the answers to questions such as "I forget about time when I'm using digital devices",

“I like using digital devices” or “I feel comfortable using my digital devices at home” and “When I come across problems with digital devices, I think I can solve them”, we define who is a digitally disengaged and/or a digitally unconfident child.

Figure 2. Percentages of digitally disengaged children and young people, Europe, 2018.

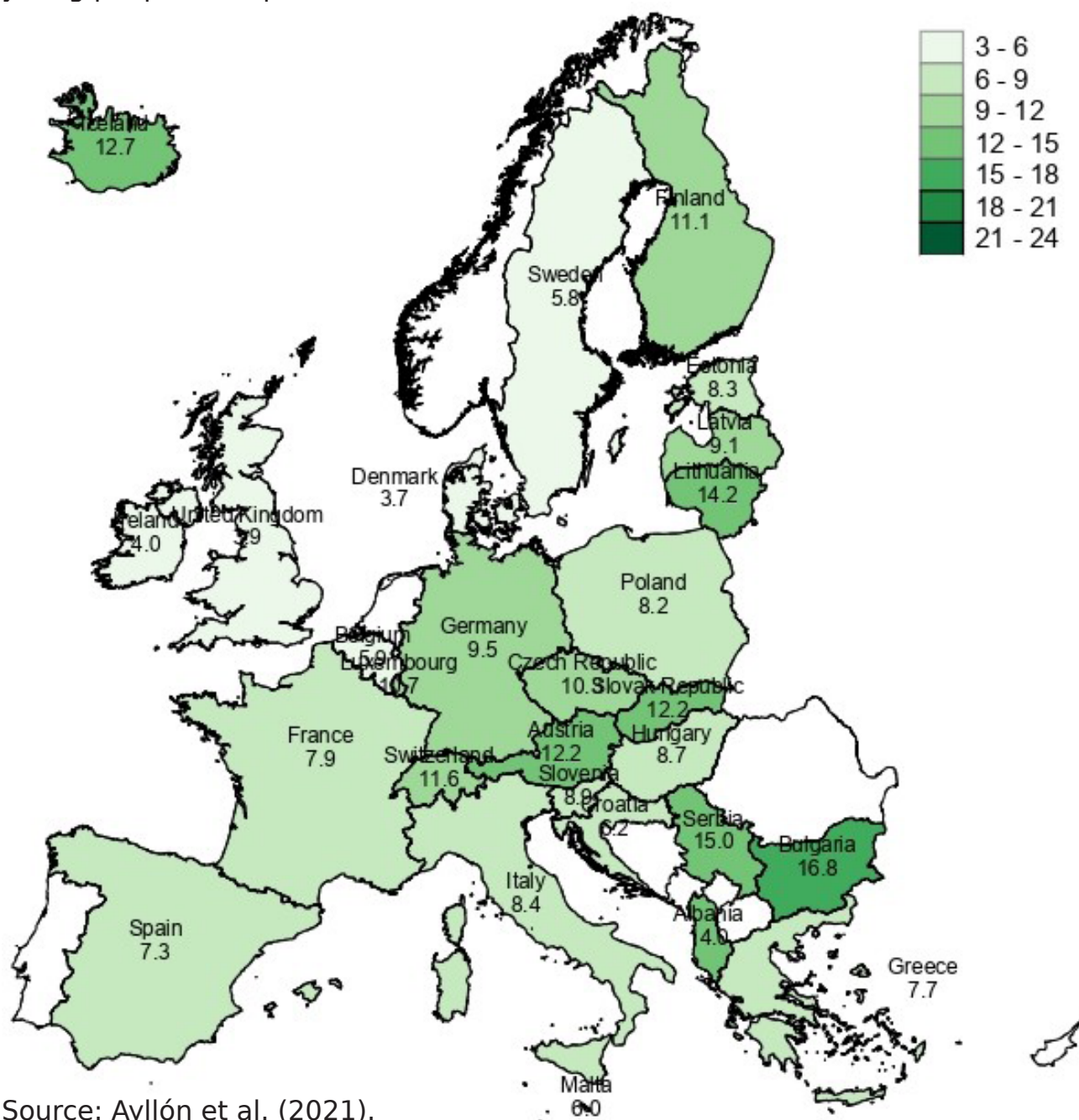


Source: Ayllón et al. (2021).

In 2018, among the children that do have access to the internet, on average 5.7% of 15-year-olds in Europe were considered digitally disengaged. Here, there are two country clusters with a certain West-East divide. Whereas in Belgium

(3.5%), France (4.8%), Germany (3.9%) and Spain (5.2%), the percentages of digitally disengaged children and young people are relatively low, in Eastern Europe such percentages are high: 17.3% in Bulgaria, 15.2% in Albania or 13.7% in Serbia. See Figure 2 for details. Also, in 2018, on average 8% of 15-year-olds in Europe were considered digitally unconfident. Similar to the above, our analyses identify a certain West-East divide with higher percentages in Bulgaria (16.8%) and Albania (14%). Furthermore, the prevalence of the lack of digital confidence is also high in Austria (12.2%), Iceland (12.7%) and Finland (11.1%).

Figure 3: Percentages of digitally unconfident children and young people, Europe, 2018.



Source: Ayllón et al. (2021).



Regarding the socio-economic characteristics associated with digital disengagement and lack of confidence, we have considered seven vulnerable groups: (i) children and young people of immigrant origin; (ii) those who cohabit with low-educated parents; (iii) those whose families have a low level of wealth; (iv) those whose families have a low level of home possessions; (v) those who need to repeat courses at school; (vi) those who have been bullied; and (vii) those who do not feel a sense of belonging to their school. We have found that one characteristic is being very closely linked to children's lack of interest in ICT: grade repetition. Little bonding with one's school, low-educated parents, being bullied, and a low level of home possessions also increase the likelihood of being digitally disengaged. We have not found any statistically significant differences in immigrant origin and with a low level of wealth. As for lack of digital confidence, again, grade repetition and low level of home possessions are the most interlinked factors with this problem. Subjective feelings of little bonding with one's school, being bullied, and a low level of wealth also increases the risk of being digitally unconfident. As for wealth, low-educated parents and immigrant origin, we have not found a statistically significant relationship.

## Digital skills and competencies to learn

Using data from the large-scale monitoring study ICILS 2018 (International Computer and Information Literacy Study) of the IEA (International Association for the Evaluation of Educational Achievement), DigiGen has analysed digital skills and competencies to learn among eighth-grade students from rural and urban areas (rural: up to 15,000 citizens; urban: more than 15,000 citizens) in the seven European countries (Denmark, Finland, France, Germany, Italy, Luxembourg and Portugal) that participated in ICILS 2018.

The analyses between rural and urban students in terms of CIL (Computer and Information Literacy) show that in none of the European countries considered did rural students achieve higher scores than urban students. In addition, students from urban areas in four European countries scored higher than students from rural areas. Concerning competencies to learn, the results of the secondary analyses show that in some European countries, there are significant differences between students from urban and rural areas in terms of 'providing references to Internet sources', 'search for information using ICT', 'present information for a given audience or purpose using ICT', 'work out whether to trust information from the internet', 'decide what information obtained from the internet is relevant to include in school work', 'organise information

5.3 % of the children in Europe are digitally deprived.

5.7% of 15-year-olds in Europe are digitally disengaged.

8% of 15-year-olds in Europe are digitally unconfident.

In none of the European countries considered did rural students achieve higher scores than urban students regarding Computer and Information Literacy.



obtained from ‘internet sources’, ‘decide where to look for information on the internet about an unfamiliar topic’ and the ‘use of ICT to collaborate with others’.

Overall, the results show that there are differences in the use of ICT between students from schools in rural and urban areas which underlines the necessity of closing the digital divide.

## Policy recommendations

**Ensure that lack of monetary resources/lack of money is not the reason why children lack access to a computer and/or internet.**

1

If we are to design effective policies aiming to combat the digital divide and ensure equal educational opportunities, more attention needs to be placed on the vulnerable groups considered in DigiGen’s analyses. Especially children and young people living in severe material deprivation, in low-income households and/or with low-educated parents. Policy efforts should target those children and young people and guarantee them access to digital devices. This should firstly be addressed in the priorities of the European Pillar of Social Rights (principle 20 “Access to essential services”), and more specifically should be reflected in the Child Guarantee national action plans, through measures which guarantee that children at risk of poverty or social exclusion are able to get access to digital devices and the internet. The set of European Digital Principles that the European Commission will propose for an inter-institutional declaration should also include access to internet and a computer as a fundamental right to ensure that all children and young people can benefit from digitalisation. Initiatives such as eduCAT 1x1 or Plan Escuela 2.0 (in Spain) can serve as examples. Both policies consisted of providing laptops to all students in high school. However, and in order to optimise public spending and its redistributive effect, these measures should particularly focus on already digitally deprived children and young people, and take into consideration equipping those devices with open-source software. The choice of which hardware and software to provide to children and young people should be well considered and should respect children’s rights. Children should be provided with a broader overview of the different tools that exist.



## **Add the inability to afford a computer to the Material and Social Deprivation (MSD) rate.**

2

Once the Europe 2020 strategy comes to an end, the Material and Social Deprivation (MSD) measure will replace the standard material and severe material deprivation indicator. This new indicator includes the share of people or households lacking at least five items out of the following 13 deprivation items: (i) face unexpected expenses; (ii) afford a one week annual holiday away from home; (iii) avoid arrears (in mortgage, rent, utility bills and/or hire purchase instalments); (iv) afford a meal with meat, chicken or fish or vegetarian equivalent every second day; (v) afford keeping their home adequately warm; (vi) have access to a car/van for personal use; (vii) replace worn-out furniture; (viii) replace worn-out clothes with new ones; (ix) have two pairs of properly fitting shoes; (x) spend a small amount of money each week on him/herself (“pocket money”); (xi) have regular leisure activities; (xii) get together with friends/family for a drink/meal at least once a month; and (xiii) have an internet connection. We recommend adding a fourteenth item: the inability to afford a computer as it is a fundamental tool for children and young people to keep up with their educational development.

## **Add more digital indicators in the European Union - Statistics on Income and Living Conditions (EU-SILC).**

3

Databases that provide a wide range of socio-economic and demographic variables usually lack digital indicators and vice versa. We argue, particularly now, that more indicators regarding ICT access and use should be included in such databases. Also, more socio-economic and demographic variables in databases with a wide range of ICT indicators should be included. The revised EU Social Scoreboard of June 2021 is promising in this respect given secondary indicators such as “Underachievement in education (including in digital skills)” and “Connectivity dimension of the Digital Economy and Society Index”.

## **Prompt children and young people’s interest in ICT as it is an essential pillar in today’s educational system.**

4

Closing the digital divide in terms of access is not enough (Recommendation no. 1). Digital interest and confidence are fundamental in times when digital devices are commonly used in education. This is why we need to boost children’s

digital interest in early childhood through well-designed school programmes that aim at enhancing children's digital skills and confidence. Education policies and systems can help increase children's creativity as well as improve their digital skills and confidence when using digital devices. Moreover, special attention should be focused on children whose subjective and socio-economic characteristics are related to digital disengagement and lack of confidence. Specific attention should be given to children who repeated grades, have been bullied and/or those from a poor background. The 2021-2027 Digital Education Action plan aims to offer a long-term strategic vision for high-quality, inclusive and accessible European digital education. It is essential that all children without discrimination are part of this dynamic and are empowered to harness the full potential of technology for education and well-being. A continued focus in the to be updated Better Internet for Kids strategy on high-quality content online and transversal digital skills could contribute to the decrease of digital disengagement and lack of confidence.

**Ensure that students are equally prepared for the digital age, regardless of where they live or the location of the school they attend.**

5

In order to prepare students for the digital age, schools need to be equally equipped, and teachers need to be similarly competent to teach the relevant skills. It should not depend on location whether students are better or worse prepared for the acquisition of digital competencies. In addition, attention should be given to the availability of both equipment and a stable internet connection, regardless of the geographical location (rural and urban). Similarly, all schools must be equipped with ICT to avoid inequalities and provide students with the necessary tools for their learning. It would be beneficial for rural areas to collaborate more closely with each other in order to take advantage of synergy effects in different regions, such as funding opportunities for the expansion of infrastructure, the development of concepts, the involvement of local cooperation partners, etc. The Long-Term Vision for the EU's rural areas (published in June 2021) includes a strong digital connectivity dimension which must be developed from a two-generation perspective, taking into account the needs of adults and children.



## **Work towards more transparency and standardised competencies between European countries.**

6

In order to create equality in terms of competencies to learn for students across Europe, it is vital that the educational systems aim to teach such competencies accordingly and to the same extent. With this, there must be more transparency and standardised competencies between European countries to educate the digital generation in the same way. The ICILS 2018 study has already highlighted international differences in CIL, which are also clearly visible at the European level. Competencies should be highlighted even more clearly, and the importance of teaching them should be underlined. The aim should be to ensure that teachers, especially pre-service teachers, are well trained in the implementation of digital media so that they can educate the next generations of students accordingly.

## **Conceive the quality of the use of ICT in teaching and learning as an essential factor.**

7

Specific focus should be placed on using ICT and the quality of its use in both teaching and learning. Therefore, it is insufficient to merely use ICT by itself; indeed, it should be adequately integrated into teaching and learning to recognise the added value of the use. Particular concepts that point out possibilities for the adequate implementation of ICT can serve as support for teachers in the form of a guide. Such concepts could also be categorised according to subject so as to further explore the integration of ICT in teaching and learning at a subject-specific level. Best practice examples can also serve as an aid by making them publicly available so that the benefit is at a European level. At this point, in particular, our results of the secondary analyses regarding competencies to learn show clear differences between students from rural and urban areas in the individual European countries. This gap should be addressed with urgency so that individual components of the use of ICT are a part of the curriculum. Perhaps in this context, especially the quality of the use of ICT in urban and rural areas should also be examined in greater depth to see which essential adjustments should be made.

## **Ensure that teachers gain training in digital competencies and practical experience.**

8

Teachers play a particularly crucial role in teaching digital



skills. They should, therefore, not be forgotten in the process of the implementation of ICT. To prepare children and young people equally for the digital future, teachers should have the appropriate competencies to teach them adequately. In this context, teachers must also be trained in the use of ICT and the teaching of ICT implementation accordingly. The training process for future teachers must be designed in such a way that the teachers of tomorrow feel well prepared to teach digital skills. Furthermore, they need practical experience in teaching digital competencies and implementing concepts on how to teach digital competencies to have a better idea of what works and what does not for teaching and using digital technology.



**DigiGen**

## **Project background**

The DigiGen project develops significant knowledge about how children and young people use and are affected by the technological transformations in their everyday lives. The project is uncovering both harmful and beneficial effects of technology in the everyday lives of children and young people. This includes a focus on the family, educational institutions, leisure time and children and young people's civic participation.

DigiGen is providing new knowledge about the barriers and opportunities that children and young people from a variety of backgrounds experience in relation to technology. The project is developing effective social, educational, health and online safety policies and practices in collaboration with national and international stakeholders.

The project combines various research methods to develop new robust participatory methodologies for including children and young people as co-researchers, co-creators and co-designers. The diverse and innovative data collection methods include a mixed-methods study design and methodological triangulation, multisite and comparative ethnographic studies, multimodal approach, interviews and diaries. The interdisciplinary research team for this Horizon 2020 project comes from nine European countries.

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