

The younger generation's views on how their education is preparing them for the digital age against the background of COVID-19

Results of an exploratory study in five European countries

DigiGen - working paper series



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Abstract: This working paper presents results of the exploratory Pilot Study COVID-19 Add-On, where interviews with children and young people were conducted between November 2020 and February 2021 in Estonia, Germany, Greece, Norway and Romania, investigating and comparing how children and young people in different countries experience and reflect the use of ICT in education during the COVID-19 pandemic.

Key words: ICT, education, COVID-19, children and young people, re-organisation of school learning, digital inequalities

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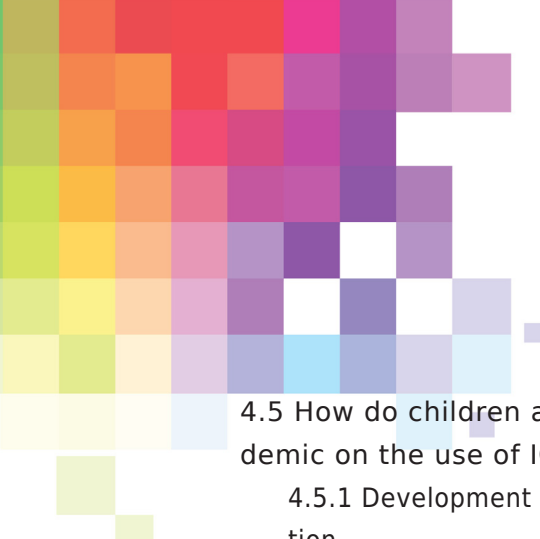
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Executive Summary

This paper presents qualitative interview research on ‘Information and communication technology (ICT) in education’ against the background of the COVID-19 pandemic. The exploratory Pilot Study COVID-19 Add-On set out to investigate the reflections and perceptions of children and young people (aged 10-16) on the use of Information and Communications Technology (ICT) in education during the COVID-19 pandemic in five European countries. Primary empirical data was generated with interviews conducted between November 2020 and February 2021 in Estonia, Germany, Greece, Norway and Romania.

Following the approach of collaborative ethnography taken in the European DigiGen project, to gain insights into children’s and young people’s experiences and perceptions of ICT in education during the pandemic, it is important to note that children and young people are involved in this research as co-researchers and experts. Thus, the findings from this exploratory pilot study serve above all to further develop and adapt the instruments for the main survey on the topic of ICT in education. However, this paper is primarily intended to provide insights into children’s and young people’s experiences and reflections and to further ensure that their voices are heard.

In the semi-structured interviews conducted with children and young people across Europe, participants gave descriptive accounts of their own ICT devices, the ICT equipment provided by their schools, as well as the applications and software used. A broad picture is given of how ICT is integrated into teaching and learning during the pandemic period in different countries. Various benefits as well as challenges and risks of ICT use, also referring to mental health, emerged from the interview data as more flexibility on the one hand, along with greater responsibility

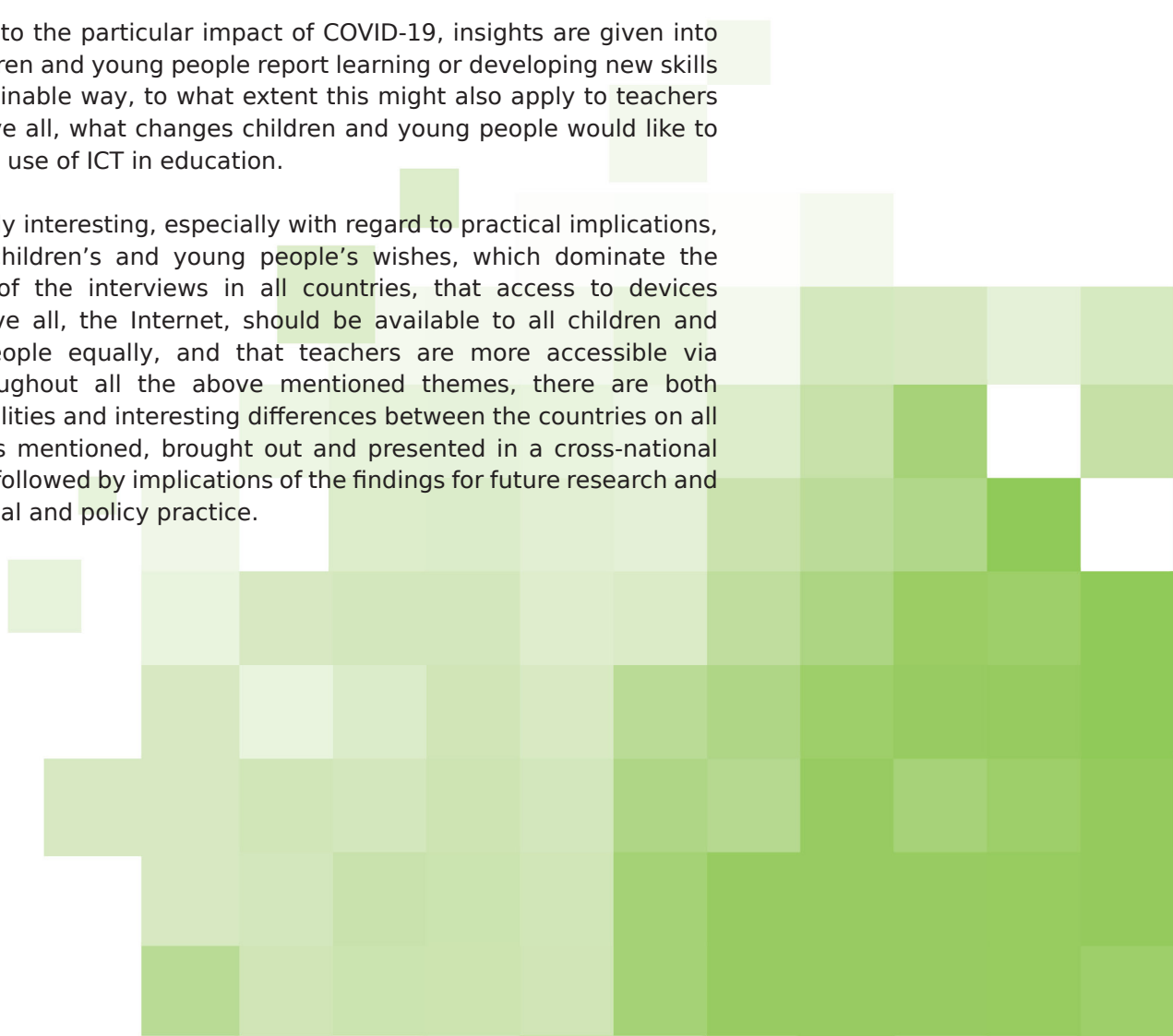


that was perceived as stressful on the other hand.

Children and young people across Europe not only describe their own experience of using ICT, but also express their views on how motivated and willing their teachers are to integrate ICT into teaching, as well as on how digitally competent they appear to be. In this context, results are presented illustrating the support situation during the pandemic, referring to support in technical issues as well as learning issues in general. In that regard, a particular need for parental involvement emerged, but equally vital was the support of teachers, who are facing new challenges, along with support among peers.

Referring to the particular impact of COVID-19, insights are given into how children and young people report learning or developing new skills in a sustainable way, to what extent this might also apply to teachers and, above all, what changes children and young people would like to see in the use of ICT in education.

Particularly interesting, especially with regard to practical implications, are the children's and young people's wishes, which dominate the majority of the interviews in all countries, that access to devices and, above all, the Internet, should be available to all children and young people equally, and that teachers are more accessible via ICT. Throughout all the above mentioned themes, there are both commonalities and interesting differences between the countries on all the issues mentioned, brought out and presented in a cross-national analysis, followed by implications of the findings for future research and educational and policy practice.



1. Introduction

The COVID-19 pandemic continues to create considerable disruptions in all aspects of daily life across Europe with significant implications for education. Essential measures to prevent the spread of the new virus, above all social distancing, require significant changes in how education and schooling is organised (European Commission, 2020a; UNESCO, 2021). Schools are being urged to re-organise school learning, especially during periods of school closures. The rethinking and reorganising of school education in order to continue providing education requires digital alternatives putting the relevance of ICT (Information and Communication Technology) at the top of the agenda (European Commission, 2020b). In this working paper, findings of the Pilot Study COVID-19 Add-On carried out as a part of Work Package 5 (WP5) on 'ICT in education' within the research of the European project "The Impact of Technological Transformations on the Digital Generation (DigiGen)" will be presented.

It is the aim of the European DigiGen research project to discover how various areas of children and young people's everyday lives such as the home, education, leisure time and civic participation are affected by technological transformations and the use of ICT, also taking into account the important aspects of health and well-being. In order to explore why and how some children and young people benefit from the use of ICT while others seem to be impacted negatively, the project is organised into eight different work packages, four of which are designed to generate new empirical data on the ways in which the above mentioned areas of children and young people's daily lives are influenced by digital technology.

Seeking to explore how children and young people experience the impact of ICT on their everyday life, a unique aspect of DigiGen's research is about involving children and young people in the research in which they act as co-researchers and experts throughout the process. Through these collaborative ethnographic practices, innovative engagement and in-depth qualitative methods, DigiGen aims to generate insightful findings. Funded by the European Commission's Horizon 2020 program, DigiGen's research is being conducted by a consortium stretching across nine different countries (Austria, Belgium, Estonia, Germany, Greece, Norway, Romania, Spain and the United Kingdom) running from December 2019 until November 2022.

In keeping with the collaborative ethnography approach and focussing on ICT in education, research in WP5 examines how children and young people across five European countries participating in WP5 (Estonia, Germany, Greece, Norway and Romania) feel their education is preparing them for their future in the digital age. In these five European countries, selected as they represent a variety of educational systems as well as considerably different levels of ICT infrastructure in school education, special attention is paid to the transition phase into the secondary education level. Reacting to the significant impact of the COVID-19 pandemic on children and young people's everyday school life, the exploratory Pilot Study COVID-19 Add-On was conducted in winter 2020/2021 within the scope of research on 'ICT in education' in order to (1) gain insights into children and young people's experience and attitude towards ICT in education in times of the COVID-19 pandemic and (2) involve children and young people as co-researchers and co-designers in further developing the instrument for the main survey from spring to autumn 2021. The following research question was addressed: How do children and young people reflect on their experiences with ICT in education during the COVID-19 pandemic?

The methods used for the pilot study are elaborated on in Chapter 2. To give an overview of the different educational systems, Chapter 3 presents 'Country Profiles' for each of the five European countries involved in WP5 in which insights are also provided on how the impact of

the COVID-19 pandemic on education developed and which national policies are particularly relevant in this context. Referring to policies concerning ICT in education, selected results of each country of the exploratory Pilot Study COVID-19 Add-On are embedded in this context, relating to the access to and use of ICT. Further results are presented in Chapter 4 within the scope of a cross-country analysis. Finally, Chapter 5 summarises the results and conclusions of the exploratory Pilot Study COVID-19 Add-On and relates the results and conclusions to the current discourse in order to derive possible implications and directions not only for further research in WP5, but also for educational research and school development in general.

2. Methodological approach applied in the exploratory Pilot Study COVID-19 Add-On

In order to describe the methodological approach applied in this study, section 2.1 of this chapter outlines the design adopted and a description of the sample. This is followed by an introduction to the instrument and the data collection process (see section 2.2). Section 2.3 is dedicated to the challenges encountered in the conducting of research on the participating countries within the exploratory Pilot Study arising from COVID-19. The chapter concludes with section 2.4, which describes the approach to the data analysis.

2.1 Design and Sample

The study embraces a qualitative research design to gain insights into children and young people's perceptions of and reflections on the topic of ICT in education against the backdrop of the COVID-19 pandemic in five European countries.

The method of convenience and snowball sampling (Cooksey & McDonald, 2019; Naderifar et al., 2017; Robinson, 2014) was chosen to select children and young people, as this study does not aim to create empirical generalisations, but gain insights into the research concern and draw out participants' personal views and experiences. Multiple approaches were taken to recruit children and young people across Europe, including national networks, especially referring to the national stakeholder committees, school contacts and links to other research projects.

Particular attention is paid to transitions from one formal educational phase to the secondary education level in order to highlight the specificity of the transition phase in the main survey from spring to autumn 2021. Depending on the education system of the different European countries, this transition takes place at different times. In the context of the exploratory Pilot Study COVID-19 Add-On, the children and young people interviewed were attending the first or second school year after transition and were of different ages (10–16 years). Since emphasis is placed on the transition phase to the secondary educational level, it should be noted that these transitions take place in different grades in the participating countries, resulting in a wide age range overall. Furthermore, a diversity of participants' background characteristics was sought in terms of gender, cultural and migration background and socio-economic status to include a wide range of children and young people with different background characteristics and thus also reach vulnerable¹ children and young people when possible.

The sample is composed of 26 school-aged children and young people across the five European countries Estonia, Germany, Greece, Norway and Romania. In Table 1 an overview of the number of participants interviewed in the individual countries is given. It also presents the participants' different background characteristics identified as sampling criteria in advance.

Whereas sampling criteria presented in Table 1 were identified in advance in order to provide diversity in the convenience sampling, throughout the selection of participants, further individual background characteristics, such as geographical location or type of school, were

¹ Oriented towards the EU Strategy on the Rights of the Child and European Child Guarantee as a starting point, in this paper, 'vulnerability' refers to children and young people at risk of disadvantages and exposed to various barriers and exclusion. Based on the individual factors contributing to vulnerability include, but are not limited to, e.g. disability and mental health as well as ethnic and cultural background, while environmental factors include parental home, parental education, and income associated with material deprivation (causing less or no access to ICT) as relevant factors contributing to vulnerability (European Commission, 2021a, European Commission, 2021b). In this research context of ICT in education, school factors also need to be considered as contributing to vulnerability, especially in the context of the COVID-19 pandemic, when different school settings may provide students.

identified in the different countries, which are considered in the sampling for the main survey within the scope of WP5 'ICT in education' in spring and autumn 2021, addressed in more detail in Chapter 5. With regard to the recording of the migration background of the interviewed children and young people, both the country of birth of the child and young people as well as the parents and the language spoken at home were taken into account. Concerning the socio-economic status, the International Socio-Economic Index of Occupational Status (ISEI) was assessed. Although characteristics were taken into account in the sampling, no analyses of background characteristics are reported in this presentation of the results of the Pilot Study COVID-19 Add-On.

Table 1: Characteristics of the interview sample

Country	Number of participants	Age range	Gender		Migration background		Socio-economic status (ISEI)		
			Female	Male	Yes	No	High	Middle	Low
Estonia	4	16	1	3	1	3	1	3	-
Germany	8	10-12	6	2	2	6	1	7	-
Greece	5	12-13	4	1	1	4	1	3	1
Norway	5	15-16	5	-	2	3	2	3	-
Romania	4	11-15	1	3	-	4	-	3	1
Total	26	10-16	17	9	6	20	5	19	2

2.2 Instrument and Data Collection

Following a phenomenological approach that allows researchers to explore the participants' experiences and views (Creswell, 2013; Patton, 2002), semi-structured interviews were conducted to explore the experiences and views of individual participants on the topic of ICT in education facing the challenging circumstances of the COVID-19 pandemic. Key preparation in the study relates to the interview guideline jointly designed by researchers from five participating European countries, including main themes and questions to be addressed during the semi-structured interview. Central themes addressed in the interviews, based on the defined objectives of WP5, are as follows: (1) The use of ICT in education as well as threats and risk in terms of ICT use, (2) children and young people's estimation of teachers' skills and willingness to use ICT, (3) the impact of the COVID-19 pandemic on the use of ICT in educational contexts and (4) wishes children and young people have when it comes to the use of ICT in education.

In all five European countries, the interviews with children and young people were conducted from researchers of the DigiGen-Project during the period from November 2020 to February 2021. The interviews were conducted in the respective national languages. Implementation formats varied according to country-specific pandemic developments and the associated constraints. While in some countries it was still possible to conduct interviews in person using distancing and hygiene masks, in other countries it was no longer feasible due to the COVID-19 developments, and a digital alternative of virtual meetings was adopted. Considering the significant impact of the COVID-19 outbreak on the implementation of qualitative educational research, the following section provides a brief overview of the challenges in the individual participating countries.

2.3 Challenges in research due to the COVID-19 pandemic

With the outbreak of the COVID-19 pandemic, various areas of everyday life, particularly education, are affected, interrupted and restricted. This also applies significantly to educational research. Research projects are affected by concerns and constraints and faced with new challenges.

Precautionary measures to prevent the spread of COVID-19 primarily focus on social distancing and travel restrictions, posing new challenges to qualitative research work. These challenges emerge not only in the implementation of data collection but right from the start in the selection of participants, especially in interview surveys such as this one. During participant recruitment, restrictions related to the COVID-19 outbreak and the need to switch to digital alternatives pose the challenge of not reaching all children and adolescents equally. This particularly refers to children and young people who are left without access to digital devices or the Internet. With regard to the implementation of the data collection where face-to-face interviewing was no longer possible, ICT offered the opportunity to virtually collect qualitative data using video conferencing software. In that context, it is important to note that being able to carry out interviews using ICT, as opposed to face-to-face interviews, can depend on the participants' and their families' equipment and familiarity with digital devices, in terms of digital competence, as well as their attitude concerning ICT.

Overall, the interviews worked very well via video conferencing software. In some interviews, it took longer to establish a safe and comfortable setting than in others. This partly related to how familiar participants were with video conferences beforehand and whether there were any distractions in the background of the participant's environment.

In Estonia, a total of four interviews with young people aged 16 were conducted. Participants were selected within the framework of a convenience sample, focusing on different background characteristics. Therefore, participants had different socio-economic backgrounds, being from both rural and urban areas as well as from both elite schools and public schools. All the interviews were conducted using video conferencing software, following the recommendations to combat the COVID-19 virus. During the time of the interviews, schools had been already using video conferencing software to maintain teaching and learning, so all the participants were already familiar with the technology and had no visible issues using it.

In Germany, a total of eight interviews with children and young people aged between 10-12 years were conducted. The children and young people interviewed were selected within the framework of a convenience sample. Thereby, attention was paid to create a broad picture of children and young people with different background characteristics. In this context, care was also taken to include children and young people from rural as well as urban areas in the sample. While the first two interviews were conducted face-to-face with distancing and face masks at the beginning of the data collection period, the implementation was then entirely changed to interviews using video conferencing software. One challenge that emerged was having less opportunity to ensure that the participant was in a quiet and undisturbed environment throughout the interview so they would feel comfortable and entirely unrestricted.

In Greece, a total of five interviews with children aged 12-13 years were conducted. The selected interviewees were attending either the first or the second grade of lower high school (Gymnasium). They were selected within the framework of a convenience sample. However, it was taken to include children with various backgrounds concerning gender (although girls were overrepresented with 4 participants), area of residence (three from Athens, one from Thessaloniki and one from a small town), ethnic background (one participant coming from Iran), type of

school (two attending private school) and economic background (including high-, medium- and low-income families). All interviews were conducted online using video conferencing software. In general, participants felt comfortable and shared their views with the researchers without major difficulties or reluctance.

In Norway, five interviews were conducted, all with female students aged 13–16. All were selected either through a convenience or snowball sampling approach. In Norway, it was important to include a geographical variation, and the participants came from both rural and urban areas. All the interviews were conducted face-to-face and all necessary COVID-19 precautions were taken. All the interviews were recorded, transcribed and jointly analysed by the Norwegian team members. The major limitation in the pilot phase was that it was unable to include any male participants. This will be taken into consideration in the main data collection phase. All interviews went well, the atmosphere was relaxed and it was felt that the interviewees were able to provide important insights to further develop the interview guides for the main study.

In Romania, four interviews were conducted with children and young people aged 10–15 years (one 11-year-old, two 12-year-olds, one 15-year-old), following a convenience sample. Attention to background and socioeconomic status was also given in order to ensure diversity. Nonetheless, due to restrictions related to meeting in person as pertaining to COVID-19 regulations at the time, no children or young people from marginalised communities were recruited, as this would have meant endangering already vulnerable groups (usually, accessing such communities means going in person with someone who can facilitate the access, e.g., a social worker). All interviews were conducted using video conferencing tools, following agreements with the children and young people's parents. One challenge was connected to establishing trust via online conference tools in order to get the shiest young people to open up and share their experiences.

2.4 Data Analysis

The interviews were electronically recorded and transcribed afterwards, following pseudonymisation techniques to protect the participants' identities. The interview transcriptions, focusing on content, were analysed, applying qualitative content analysis (Mayring, 2014). After the interviews were transcribed, they were translated into English. Maintaining the qualitative content analysis approach, a set of categories was identified. Following mixed procedure, thematic coding was performed, combining deductive and inductive data analysis approaches (Mayring, 2014). Researchers in the different country teams worked through their transcripts, and through cross-national continuous exchange, the category system was developed. Central themes given by the cross-national jointly developed interview guidelines have, on the one hand, deductively provided categories to be used when analysing the data material. However, these were then modified or extended with subcategories based on the themes derived from the data material itself.

In order to allow cross-country comparison, all five country teams coded the interview data using the jointly developed category system. Thus, a table was created to link the interview data from all countries, with quotations organised in the jointly developed category system. This layout made it easier to perform a cross-country analysis to identify differences and commonalities, as further elaborated in Chapter 4.

Before the results of the cross-country analyses are described, Chapter 3 gives an overview of the different educational systems in the form of individual Country Profiles of the countries involved in the Pilot Study COVID-19 Add-On.

3. Country Profiles

The COVID-19 pandemic has had a global impact on educational systems. Providing an overview of the different educational systems of the countries involved in the Pilot Study COVID-19 Add-On, this chapter introduces individual Country Profiles and provides insight into how the impact of the COVID-19 pandemic on education is developing.

In the following, the Country Profiles of the individual countries, Estonia (see section 3.1), Germany (see section 3.2), Greece (see section 3.3), Norway (see section 3.4) and Romania (see section 3.5) are introduced. First, insights are provided into the situation regarding 'ICT in school education during the COVID-19 pandemic. Second, ICT policies and strategies to support schools during the COVID-19 pandemic will be taken up and finally, children's and young people's perspectives towards ICT access and ICT use during the pandemic as well as selected findings from the exploratory Pilot Study COVID 19 Add-On, will be presented. It is important to note that the situations described in the Country Profiles refer to the period from March 2020, the outbreak of the global COVID-19 pandemic, until the end of the interview data collection in February 2021.

3.1 Estonia

Insight into the situation regarding 'ICT in school education' in Estonia during the COVID-19 pandemic

The Ministry of Education and Research (HTM, 2020a) started providing COVID-19-related guidelines and recommendations for schools in Estonia at the end of February 2020. On 6 March, the first school in Estonia was closed (HITSA, 2020a) and as the situation escalated, on 12 March, 2020, the Estonian government announced it was an emergency situation² (RT III, 76, 1), followed by an order that from 16 March, 2020, all schools were to apply only digital solutions (HTM, 2020b). These measures were alleviated from 15 May, 2020 onwards. National exams for basic school (1st–9th grade, age up to 16) were made voluntary, leaving children and young people the possibility to graduate from basic school with annual grades. From 15 May, schools were allowed to conduct some in-person lessons and learning activities, but in smaller groups and using alternatives outside.

The situation brought into focus the importance of more non-formal communication between parents and teachers and how to create an environment that supports learning, with both parents and teachers having their own role in the process (Beilmann et al., 2020). It was concluded from the preliminary results of the research that regardless of the challenges, the Estonian general education schools managed well with distance learning (Tallinn University, 2021).

Overall, children and young people in Estonia had better access to devices needed for distance learning and were more satisfied with distance learning compared to other countries: 14 percent of young people were provided a device by their school and only one young person out of ten was dissatisfied with the changes in the organisation of education (Fritz & Persson, 2020). Still, around 1,000 children and young people have not participated in any of the distance learning activities (Estonian Parliament, 2020). Problems for children and young people with special needs were aggravated and a need for support services grew. Overall, mental health

² With declaring an emergency situation, the Government of Estonia restricted freedom of movement regarding educational institutions (except kindergarten) and public gatherings. Theatres, cinemas, museums night-clubs were closed and travelling restricted (RT III, 77, 1).

issues increased, and both teachers and children and young people needed more psychological counselling (Rosenblad et al., 2021).

ICT-policies and measures to support schools during the COVID-19 pandemic

Estonia's main policy regarding distance learning was to continue with learning and teaching activities via digital solutions—learning activities in general continued. To support families, schools and children, initiatives from the national and local government level and from communities in general were carried out. A Facebook group 'Home learning with the help of technology' was created, gaining more than 8,000 members within days and a webinar for parents on how to support their children during distance learning was held a day before the schools were shut, followed by 36,000 participants. On 16 March, a hotline for schools without educational technologists and in need of support was opened. Within two months, 80 webinars were held for teachers, children and young people and parents to cope with distance learning. Parents were asked to turn to schools if a computer was needed and a Facebook group was created to provide a computer to every child in need. Within a month, 1,200 children received a computer needed for learning. The Information Technology Foundation for Education (HITSA) (2020b) has brought out aspects that helped Estonian schools to rapidly shift to distance learning:

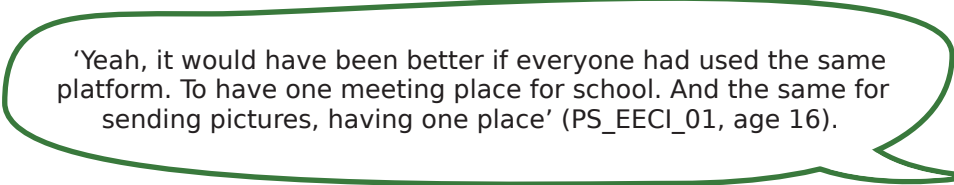
1. Estonia has invested from the nineties onwards in the infrastructure of schools, the skills of teachers and the creation of e-learning materials, known as the project 'Tiger Leap'.
2. There has been strong cooperation with the private sector (e.g., Skype) that supports ICT training for public higher-level education, etc.
3. For a decade, Estonia has developed a strong network of educational technologists³ who work in schools, although not in every school.
4. In 2014, the requirement for digital competence as a general competence was added to the national general education curriculum. Now, almost 90 percent of general schools and 60 percent of kindergartens offer some kind of technology-related activities. Around one third of children and young people in general education are involved in learning more complex ICT skills such as programming, cyber security and 3D printing.
5. Schools are offered practical support on a grassroots level by HITSA, which is combined with national-level strategic coordination.

Children's and young people's perspectives towards ICT access related to ICT use in Estonia during the pandemic - first findings from the exploratory Pilot Study COVID-19 Add-On

In Estonia, four interviews were conducted with ninth graders (aged 16) who experienced the emergency situation and rapid shift to distance learning in spring 2020 while still in eighth grade from November to December 2020 within the exploratory Pilot Study COVID-19 Add-On.

Amongst the young people interviewed, no one had any difficulty regarding devices and access to digital learning during the distance learning period. However, it was pointed out that some children and families were in need of devices that schools, local governments or community initiatives helped to provide. During the distance learning period, none of the interviewees needed any help regarding technical issues or skills in using applications and platforms. In general, the rapid shift to distance learning went rather well, as experienced by the young people: "I was even quite surprised by how smoothly and quickly it all went. Well, okay, the first week or two of school, you know, there were technical difficulties and you forgot to write something down" (PS_EECI_04, age 16).

³ Starting from 2010 Tallinn University and the University of Tartu from 2014 offers master's curricula for educational technologists (EHIS).



'Yeah, it would have been better if everyone had used the same platform. To have one meeting place for school. And the same for sending pictures, having one place' (PS_EECI_01, age 16).



Young people preferred that teachers would use one or a limited number of more common platforms across the subjects and assignments. Throughout the period of distance learning, the high variability of platforms, environments, applications, etc. used by different teachers was considered disorienting.

One of the challenges distance learning posed for young people was coping with constantly decreasing motivation for learning. As one participant illustrated: 'I personally got pretty lazy at some point. And from then on ... the constant decline of motivation began' (PS_EECI_01, age 16).

Hence, even with a smooth transition to distance learning and overall good access to digital devices, it still poses challenges and difficulties for young people. This illustrates well the need for deeper understanding of the experiences of young people, as this would allow the design of a distance learning environment that supports all young people, regardless their abilities and skills.

3.2 Germany

Insight into the situation regarding 'ICT in school education' in Germany during the COVID-19 pandemic

From the beginning of the COVID-19 pandemic, schools in Germany had to close without warning from one day to the next in mid-March 2020 due to the general lockdown in Germany. Teaching formats had to be reorganised under the pandemic conditions. After an extended spring break, schools started to reorganise school learning using technology where possible and available. It is important to note that coping with the situation was easier for schools that were already more advanced in digitalisation. This has also been revealed in a representative study that was conducted throughout Germany at the start of the COVID-19 period in April 2020 showing that schools more advanced in digitalisation, that is, with 1) access to learning platforms where teachers conduct digitally supported learning processes and 2) some of the children and young people equipped with digital devices, were in a better position to cope with the situation than other schools (Eickelmann & Drossel, 2020).

The Allensbach Institute for Demoscopy surveyed a total of 1,071 students in grades 5 to 10 in the study 'Learning in Times of Corona' commissioned by the Telekom Foundation. The focus was especially on learning during the time of school closures due to the COVID-19 pandemic. Despite the self-certified learning deficits, the majority of children and young people found a surprisingly positive balance during the school closures, with 58 percent saying they had coped 'well' or even 'very well' with learning at home. The results implied that children and young people had developed in the sense that they had made progress in using computers or digital applications. More than half said they were now better organised and able to work through information themselves (Allensbach Institute for Demoscopy, 2021).

Investigating learning in the early 2020s during school closures, with the study 'NEPS Corona & Bildung' focusing on which prerequisites and contextual factors are related to how well students cope with the new learning situation, 1,452 parents have been surveyed. The study reveals that slightly more than half of the parents (59%) state that their children, aged 14, coped rather well

or well with learning at home. The children's reading competence as well as their willingness to put effort into the tasks played a major role in this, as it was revealed that children with higher reading skills and those with a higher degree of willingness coped better in the new learning situation according to their parents, and furthermore, are reported to be easier to motivate to learn than children with lower reading competences. The fact that it was more difficult for students with lower reading competences to cope with the situation of learning at home points to the risk that achievement gaps may be widening. (Leibniz-Institut für Bildungsverläufe e.V., 2021).

Starting in May 2020, schools in all 16 German federal states, which are responsible for school education in Germany, were allowed to reopen step by step, with a high priority going to children and young people in graduating and qualification-relevant classes as well as in the last grade of primary school (KMK, 2019, 2020). After a return to in-person classes had been initiated step by step, it did not take long until, in mid-December 2020, schools in Germany had to reorganise school learning again due to a significant increase in the number of COVID-19 infections. However, overall, schools, teachers, children and young people were better prepared in this second shut-down than in the first phase during spring 2020 (KWiK, 2021). All in all, most schools were able to benefit from the experience and technical developments from the first half of 2020. It was not until February 2021 that schools were allowed to start gradually moving to in-person learning with organisational measures in place to reduce the risk of infection in class. In most federal states, primary schools opened in the beginning of March and graduating and qualification-relevant classes were allowed to return to the classroom.

ICT policies and measures to support schools during the COVID-19 pandemic

In order to support schools in the reorganisation of learning and use of digital tools and mobile devices during the pandemic-induced period of reorganisation of school learning, several education policy measures were put in place in Germany. In particular, an increase in funds through an extension of the 'Digitalpakt Schule' (Digital Pact for Schools) for digital devices for disadvantaged children and young people and for teachers, which was initiated with funds from the Federal Ministry already before the pandemic, was found to be supportive. Moreover, to ensure that schools were better equipped with digital technology video conferencing tools, digital platforms, didactic-pedagogical handouts (e.g., MSB NRW, 2020) and online training for teachers were offered to schools and teachers (Medienberatung NRW, 2021). Overall, all German federal states have initiated numerous measures to support schools. Against this backdrop, a digital push in schools was acknowledged across the country (Leopoldina, 2020). However, the increase in social disparities in digitally supported learning across the country led to a public discussion about new digital divides and their impact on children and young people in terms of an increase of social disparities (Expert Commission of the Friedrich Ebert foundation, 2021).

Children's and young people's perspectives towards ICT access related to ICT use in Germany during the pandemic - first findings from the exploratory Pilot Study COVID-19 Add-On

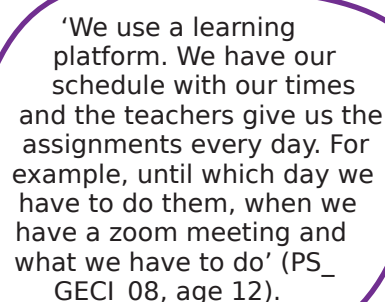
With the exploratory Pilot Study COVID-19 Add-On in the context of DigiGen, empirical-based insights are provided into children's and young people's experiences regarding teaching and learning during the pandemic, which are examined in more detail across all five participating countries in the 'cross-case analysis' (see Chapter 4).

Eight interviews with fifth and sixth graders (aged 10–12), that is, children and young people in the first or second year after the transition from primary to secondary school, were conducted in Germany within the scope of the exploratory Pilot Study in winter 2020/2021 and thus overlapped with the second major phase of reorganisation of school learning. In the following

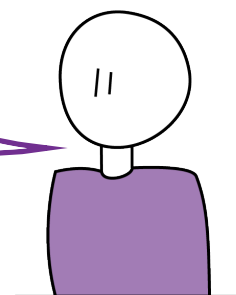
section, selected results from the exploratory Pilot Study on 'ICT access', as an important predictor for an efficient transition to the reorganisation of school learning, related to 'ICT use', will complement the overview of the situation concerning schooling during the pandemic described above.

According to children's and young people's reports, learning management systems proved to be the most basic means of enabling the reorganisation of school learning and maintaining teaching and learning processes during the pandemic. All interviewed children and young people attended different types of schools and had access to different learning management systems such as online school platforms and school clouds provided by their schools. However, in order to benefit from the provided access to online platforms, digital devices and an Internet connection are necessary. While some children and young people reported having been provided with their own digital devices by their schools to be used for learning at home, 'Since last fall, fifth and sixth grade have tablets. And everyone older than that, so seventh grade and up, have laptops' (PS_GECI_07, age 11). Other children and young people were left on their own to use their own digital devices for distance learning or share devices with others at home in order to attend online classes or gather learning material provided via online learning management systems. Another child (aged 10) reported that 'My mom printed the worksheets out at work and brought them home for me so I could work on them at home' (PS_GECI_02, age 10).

It emerged from the reported experiences that the children and young people from digitally advanced schools were able to cope with the challenging situation more smoothly, as shifting to distance learning was less difficult due to the equipment and familiarity with hardware and software already being mostly in place.



'We use a learning platform. We have our schedule with our times and the teachers give us the assignments every day. For example, until which day we have to do them, when we have a zoom meeting and what we have to do' (PS_GECI_08, age 12).



For others, the situation towards accessing, handling and using digital technology for learning was more challenging, as illustrated in the following interview quote: 'And we actually only got a school platform recently when the second lockdown took place. We didn't have it before and the school platform was another new thing that many people couldn't cope with or couldn't get into. And I didn't get along with it at the beginning because we didn't know anything like that yet' (PS_GECI_05, age 12).

With only some initial selected insights into ICT in education and its conditions during the pandemic in Germany, relevant aspects derived from this study contribute to a more holistic picture and highlight the importance of researching disparities in schools' digital preparedness in order to promote inclusivity in education and ICT participation and foster educational equity.

Overall, the situation of access to and use of ICT for teaching and learning is very diverse. While some children and young people describe that they had already had extensive experience with the use of digital technologies, this contrasts with other children and young people having expressed that they had not yet been prepared for the use of digital media, but were able to gain their first experiences due to the shift to the reorganisation of school learning. While this reorganisation was new for children and young people, it seemed that the children and young people already in digitally advanced schools had easier access to digital technology. However, it also appeared that the experience of reorganisation of school learning during the first lockdown phase made both children and young people and teachers better prepared for the phase of reorganisation of school learning during the second lockdown.

3.3 Greece

Insight into the situation regarding 'ICT in school education' in Greece during the COVID-19 pandemic

In Greece, primary and secondary schools have been mostly closed for almost a year. In general, Greek schools have remained closed 21 of the 38 weeks of the active school year, excluding holidays. Children and young people are in ongoing distance education. These 21 weeks of distance learning exhibited many technical problems, which led the Ministry of Education to impose a division in time and bandwidth so that the lower and higher secondary classes operate in the morning (8.00–14.00), and primary and pre-school education in the afternoon (14.10–17.20 and 14.10–16.20 respectively).

Schools closed for the first time on 11 March, 2020 and during the school year 2019–2020, there was a continuous nationwide opening and closing decision. In that period, the second lockdown, with very restricted measures imposed, involved schools opening for young people graduating from upper high school (Lyceum) and two months later, lower secondary schools (Gymnasium) followed, whereas primary and pre-school education opened on 1 June, 2020 for four weeks until the summer break. During the school year 2020–2021, opening and closure has been fragmented beginning from September, differentiated according to place and levels of infection. The scheme of rotating courses was generally not applied. Schools closed throughout the country on 16 November, 2020 and remained largely closed until the Easter break at the end of April 2021.

The COVID-19 pandemic that led to this extended closure of schools created the need for emergency treatment in online education provision. The handling of this crisis has highlighted a number of problems, such as the inadequacy of distance education in Greece, the lack of technological equipment, the delays in teacher training, the lack of support, guidance and supervision and the inadequacy of the leadership of the Ministry of Education to plan regular and strategic interventions, that is, to integrate crucial measures within a comprehensive education policy. During the summer, in general, there was no timely organised training of teachers, no alternative schedules or curricula were prepared, the technical infrastructure of the schools was not substantially strengthened and the children and young people and their families were not prepared for the new interruptions that followed (Anastassiadis, 2020; Manoussou et al., 2021).

ICT policies and measures to support schools during the COVID-19 pandemic

The Ministry of Education focused on the following issues during the different phases of specific and generalised lockdowns:

1. The upgrade of the public networks and platforms of the pre-existing Greek School Network (<https://www.sch.gr>)
2. The collaboration between the Greek School Network providing possibilities for asynchronous education and free use of the CISCO Webex platform providing possibilities of synchronous education
3. No charge for access to all the educational platforms used by the Ministry for distance learning by the major telecommunications companies
4. Possibility of connection through landline on the Webex platform
5. Increase of schools' inventory of laptops to over 80,000 devices
6. Specific instructions to the Institute of Educational Policy for the design of distance learning programmes
7. Training for distance learning directed to teachers

For some of the measures mentioned above, particularly the equipment and the training of teachers, severe delays have been reported by teachers and the media.

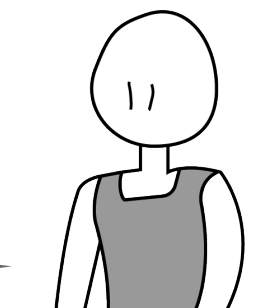
Children's and young people's perspectives towards ICT access related to ICT use in Greece during the pandemic - first findings from the exploratory Pilot Study COVID-19 Add-On

With the exploratory Pilot Study COVID-19 Add-On in the context of DigiGen, empirical-based insights are provided into children's and young people's experiences regarding teaching and learning during the pandemic, which are examined in more detail across all five participating countries in the 'cross-country analysis' (see Chapter 4).

Five online interviews with seventh and eighth graders (aged 12-13), children in the first or second year after transition from primary to secondary school (Gymnasium), within the scope of the exploratory Pilot Study, were conducted in Greece in winter 2020/2021 and thus overlapped with the second major phase of distance learning. The following section will present selected findings from the exploratory Pilot Study on 'ICT access' as a major determinant of an efficient shift to distance education, linked to 'ICT use', to further elaborate on the overview of the school education situation during the pandemic described above.

The overall assessment of the distance learning experience by children themselves has been problematic in different aspects. First of all, differences in the readiness of schools to transition to distance learning between the different phases of the pandemic were reported: 'The first time [March until May 2020 lockdown], the [private] school was not prepared, until the platforms were set up. We spent two weeks without courses. Afterwards we had regular classes. Last spring, we did classes with Microsoft Teams but this year with Google meet' (PS_GRCI_05, age 13).

'From the 15 children who attended my class, only 4 attend the Webex. Those children were from other countries and they didn't know how to enter. [...] They come from many countries, Syria, Pakistan, Afghanistan etc. In my classroom I am the only one who has a computer. The other children are with a mobile phone. Some children say: no more classes, at last!' (PS_GRCI_02, age 12).

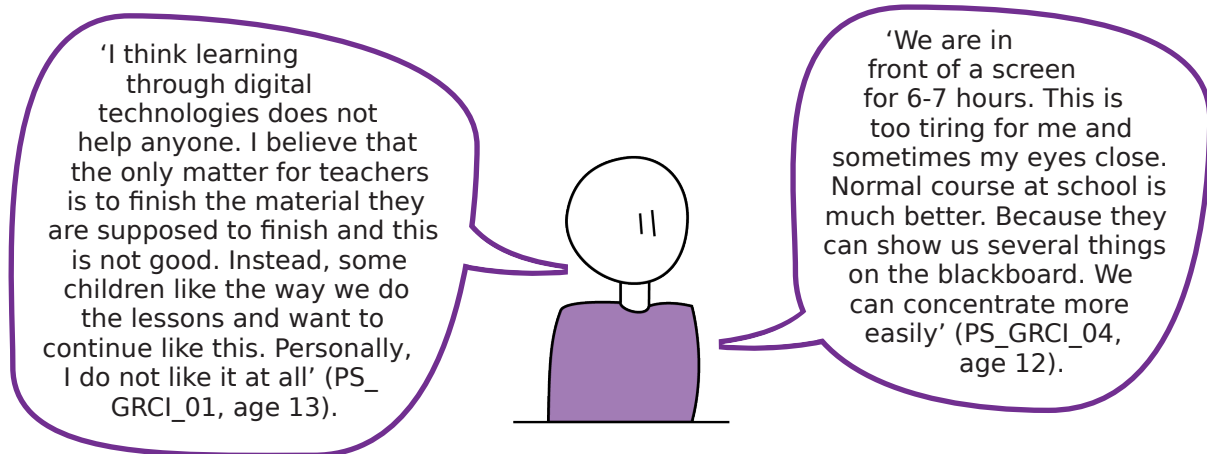


Technical issues have also been hindering synchronous education on both sides of the continuum, that is, children and young people and teachers, especially in cases of socioeconomic inequalities: 'We have our mobile phones, a tablet and a laptop; my sister has a laptop. But I miss a camera. Sometimes it freezes and I ask teachers to repeat, but they think I didn't pay attention. The thing is that my sister also has classes, so our connectivity is reduced and the Internet freezes' (PS_GRCI_03, age 12).

Another issue that emerged through the experience of the lockdowns and home schooling was the blurry distinction between (home)work and leisure, as children reported days to be 'more full' (PS_GRCI_01, age 13), leading to a work overload that decreased their free time: 'It is as easy as it was before [to keep up]. We simply had more homework, so I spent more time for school. I think that we are all left a little bit behind because with online classes we don't communicate so well. So, if we went to school normally [physically] we would have learnt much more things' (PS_GRCI_05, age 13).

Finally, when evaluating the use of ICT during the pandemic, the positive impact on the

acquisition and/or enhancement of digital skills is followed by a feeling of fatigue stemming from the excessive use and the time spent in front of the screen: 'Now I use them [digital technologies] much more than before the lockdowns. Many times, I feel that I use them a lot and I get stuck. I mean I would like sometimes to stop using them so much' (PS_GRCI_05, age 13).



3.4 Norway

Insight into the situation regarding 'ICT in school education' in Norway during the COVID-19 pandemic

The COVID-19 pandemic caused a large disruption to education in Norway. In order to reduce the spread of the virus, the Norwegian government introduced a series of measures that meant that the country was essentially in a lockdown from 12 March, 2020. The lockdown imposed restrictions on schooling and leisure activities alike. During the first wave of the virus in Norway, many children and young people found themselves at home, having access to few activities. The ability to respond to school closures meant that the government together with school leaders and teachers needed to act quickly to prevent the loss of learning. Research has documented the harm from prolonged school closure, which include, among other things, effects on learning, reductions in physical activity and a range of impacts on mental health and well-being due to social isolation and reduced social support (Viner et al., 2020). From the start of the pandemic, one of the government's goals has been to spare children from the most stringent measures to the greatest extent possible. Yet, during the first lockdown period, schools were forced to replace time in class with online learning or what some refer to as schooling at home. This was for the most part facilitated by teachers, but with much-needed support from parents or other family members.

In Norway, Early Childhood Education and Care (ECEC) centres opened on 20 April following regulations and guidelines for infection and control measures presented on 16 April. Subsequently the first grades in primary schools and after school clubs reopened on 27 April, and on 11 May the rest of the schools were reopened (Regjeringen, 2021), but with room for local adaptation according to the situation in the county or town. The strategy from the authorities was that the youngest and most vulnerable were to be prioritised and every effort was made to keep schools open for these particular groups. Norwegian and international data appear to support the argument that schools and ECEC centres should be kept open, with good infection control measures, and that closing them should be a last resort. The European Centre for Disease Prevention and Control (ECDC) maintains that the risk of secondary transmission among younger children is low (ECDC, 2020). However, all countries report that outbreaks can occur in schools and ECEC centres, and that infection control measures are needed to keep

schools open.

In the autumn of 2020, quarantine measures have been frequent occurrences for pupils and staff in some parts of the country. In November, the month when the most schools were affected, 31 schools nationwide (1% of all schools in Norway) had over 10 positive cases, whereas on 12 December schools (0.4% of all schools in Norway) had 10 or more positive cases (FHI, 2020). Upper secondary schools were hit harder than primary and lower secondary schools. Only one of the country's 5,730 ECEC centres had more than ten infected children within the same time period—less than 2 percent of the centres had children or staff with a confirmed infection. After the infection peak in the week starting 1 November, the incidence rate among children and young people fell by almost 60 percent within four weeks. This happened while most schools were open.

The traffic light model, with green, yellow and red tiers, takes into account the local transmission rate and expert advice on restrictions. The Ministry of Education and Research has allowed greater use of home schooling for reasons other than infection control, despite heavy criticism being levied at the consultation proposal. The authorities introduced the possibility of adapting local measures for schools according to the tiered control measured system. A yellow level indicates that schools are either to close and transfer teaching to digital platforms or a roster where children are organised in cohorts with teaching partially online.

Signs of a third peak began in February 2021 and are ongoing as of March 2021. A new report from the Norwegian Institute of Public Health (FHI) examines the effects of the pandemic on the health of children and adolescents (FHI, 2021). The report shows that vulnerable groups may suffer more during the pandemic than young people in general, which is a concern for the Norwegian Ombudsperson for Children, Save the Children and other authorities. Both the pandemic itself and the infection control measures are considered to be contributory factors. However, forthcoming research shows that some children and young people benefited from the situation, in particular children with anxiety issues, those facing bullying and other social- and health-related challenges (Gudmundsdottir & Hathaway, forthcoming).

ICT policies and measures to support schools during the COVID-19 pandemic

A majority of teachers and children and young people had access to computers and software owned by the employer or the school that were of satisfactory quality. A relatively large proportion of teachers nevertheless reported that the infrastructure has been an obstacle to being able to carry out desirable teaching. Over 90 percent of the teachers have gained better digital competence and say that the experiences will affect their future teaching. The majority of teachers reported that they had no previous experience in online teaching (Gudmundsdottir & Hathaway, 2020).

The availability of ICT in Norway makes it possible to continue instruction and learning when physical interactions are no longer possible. However, both teachers and children and young people needed to be very familiar with these technologies in order for them to be effective. In many cases this included online tools such as Zoom or Teams, which many of the teachers, children and young people had limited or no experience in using. The extent to which both teachers and school children were prepared for the school closures that took place can be found in the results from the 2018 Teaching and Learning International Survey (TALIS). This survey, which was conducted prior to the pandemic, shows that on average, across participating OECD countries and economies, only slightly more than half of lower-secondary teachers (53%) reported letting children and young people use ICT for projects or class work 'frequently' or 'always'. In Norway, 46 percent of teachers reported that use of ICT for teaching was included in their formal education or training, which is lower than the average of the OECD countries taking part in TALIS (56%). At the time of the survey, 66 percent of teachers in Norway felt that

they could support children and young people's learning through the use of digital technology (e.g., computers, tablets, smart boards) 'quite a bit' or 'a lot', which is close to the average of the OECD countries participating in TALIS (67%) (OECD, 2019a).

Moreover, data from the 2018 cycle of the Programme for International Student Assessment (PISA) show that in Norway, 76 percent of school children and young people were enrolled in a school whose principal 'agreed' or 'strongly agreed' that an effective online learning support platform is available, which is higher than the average across OECD countries (54%) (OECD, 2019b).

In November, the 2020 national budget was revised. The result was an increase in support for the purchase of digital teaching aids. An additional 51 million Norwegian Krone was added for that purpose. The amount to be distributed between counties that applied for extra funds was an increase from 60 million to 111 million. A survey from August 2020 shows that about half of the children and young people live in municipalities with full one-to-one coverage of digital devices (UiO, 2020). The digital devices children and young people have access to from school are more mobile now than five years ago. These are for example, laptops, Chromebooks and tablets (Fjørtoft et al., 2019).

The majority of primary school teachers state that they were able to help children and young people with their school work, check that they did their homework and evaluate their academic work. At the same time, it seems that the teachers had challenges in following up the children and young people's attendance in the teaching, differentiating the teaching and assessing the children and young people's work. For example, 52 percent state that they were only partially able to ensure that the children and young people were making academic progress, and 45 percent were only partially able to differentiate the teaching. These challenges may have contributed to the children and young people experiencing less learning during the shutdown (Utdanningsdirektoratet, 2020).

Children's and young people's perspectives towards ICT access related to ICT use in Norway during the pandemic - first findings from the exploratory Pilot Study COVID-19 Add-On

Five interviews were conducted with children and young people in the age group of 13–16 years who were transitioning from primary to secondary school and from secondary school to upper secondary school⁴. The interviews were conducted face-to-face with one researcher conducting one interview each. The interviews were conducted in the winter term in 2020. In the section below a selection of results from the exploratory Pilot Study focusing on 'ICT access' related to 'ICT use' is presented.

One main finding from all the interviews was that each of the participants had a laptop or tablet provided by the school and Microsoft Teams was the main channel for video communication between the children and young people and teachers and also between the children and young people themselves. In the first weeks of the initial lockdown period the situation was described as 'chaotic' and somewhat 'messy'. For example, one of the participants described the situation: 'So in the beginning it went a little bad then everything was new for everyone, but as time went on, I think many students perceived it as a bit overloading with teaching at home' (PS_NOCI_02, age 16). Another also referred to the situation as stressful, stating that 'sometimes it [school from home] was a bit stressful because you always had to somehow keep the time for when we had free time and when the class started and then when the class ended you did not have time to eat. You also had to make sure you got back to class when it started again' (PS_NOCI_01, age 15). For this participant the issue of self-regulating time was challenging as well as the overall

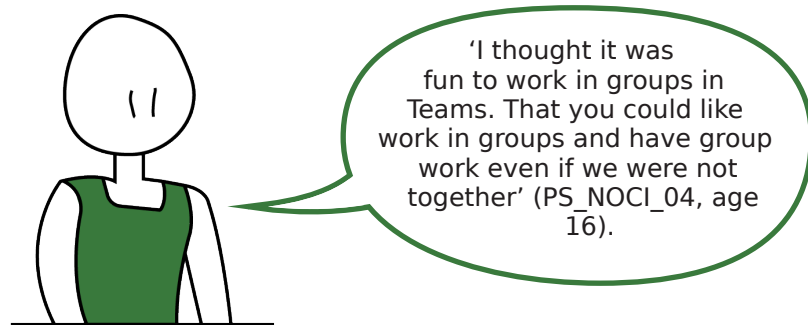
⁴ Due to being a convenience sample, researchers in Norway were able to include participants in either one transition phase or the other. From primary to lower secondary and lower secondary to upper secondary.



stress issues.

Another important issue brought up in the interviews related to undesirable outcomes such as when a young person 'did not get the help that you perhaps had needed' (PS_NOCI_02, age 16). The interviews also uncovered thoughts about other children and young people who might struggle, for example 'it must be very negative for those who have bad grades because of it' (PS_NOCI_01, age 15).

Having school at home (or online school) was not all bad, as some of the interviews brought out issues that were more positive. Another positive outcome was that 'You could choose to work alone or if you wanted to work with your friend or with someone else in the class' (PS_NOCI_01, age 15).



'I thought it was fun to work in groups in Teams. That you could like work in groups and have group work even if we were not together' (PS_NOCI_04, age 16).

3.5 Romania

Insight into the situation regarding 'ICT in school education' in Romania during the COVID-19 pandemic

In the beginning of the COVID-19 pandemic, schools in Romania closed as well during the spring 2020 lockdown. They reopened briefly in May 2020, only to close again for the summer break. The fall semester started with a hybrid scenario, with most children in online schooling or alternating between in-person and virtual classes, with priority to in-person learning being given to primary school children and those in graduating years.

A rapid assessment of the education crisis in Romania, which was amplified by the COVID-19 pandemic, identified issues related to the following: educational inequality with many young people at risk of poverty and social exclusion, major difficulties in switching to the online teaching system, a generalised need to develop digital competencies among teachers, and inequalities in children's access to online educational activities, which was identified as highly dependent on the household infrastructure, for example, broadband connection, laptop/computer, smartphone, etc. (Forian & Țoc, 2020).

According to national statistical data collected at the beginning of the pandemic (IRES, 2020), 32 percent of Romanian children enrolled in pre-university education did not have individual exclusive access to a functional device (desktop, laptop, tablet), which made the presence of pupils in online classes partial or non-existent. Taking into account the number of children and young people enrolled in pre-university education in the school year 2019–2020 (2,824,594), the actual number of school children and young people who did not have access or had limited access to a device to participate in online education was in fact 903,870, 3.6 times higher than the Ministry of Education assessment (EduPedu.ro, 2020). In the case of households with several children, 68 percent have a device for each child and 32 percent have to share devices with each other or have no device. The highest rate of children who do not have access to a personal device is in rural areas, where 39 percent of them do not have a sufficient number of devices compared to 24 percent in urban areas (Romanian Institute for Evaluation and Strategy, 2020).

In an online study conducted by Save the Children on a sample of 5,000 Romanian children,

47 percent of them reported they had only a mobile phone to participate in online classes, while 27.2 percent of children reported having school subjects that were not covered during the spring semester of 2020 (Save the Children, 2020). In another assessment conducted by UNICEF, Romanian pupils reported disliking the 'online learning only' or distance learning, as they reported the lack of real support from teachers, lack of proper and personalised feedback, as well as it being impossible to apply practical knowledge in labs and other spaces for vocational profiles (UNICEF, 2020a).

Furthermore, in an assessment of the teachers' needs in relation to their use of digital technologies in the teaching/learning process, over 6,000 teachers from all the counties in Romania identified in March 2020 several limitations with regards to teaching needs, for example, personalised support for pupils with special learning needs, authentic communication, monitoring the rhythm of learning, feedback for confirming acquisitions and individual counselling (Botnariuc et al., 2020). Nonetheless, the most prominent needs, and those which generated most disparities between rural/urban areas, were related to technical provisions, for example, hardware, installing and maintenance, limited access to the Internet, underperforming/old hardware and access to e-learning platforms (Botnariuc et al., 2020). Of those surveyed in spring 2020, 22 percent said they received no support whatsoever from the authorities (that is, technical support, pedagogical support or regarding the content of the subjects). One year into the pandemic, from an online sample of 10,000 teachers from all counties in Romania (data collected in February 2021), 69 percent declared they worked more than in the previous year to ensure proper teaching for their pupils (CRED project, 2020–2021).

ICT policies and measures to support schools during the COVID-19 pandemic

The Ministry of Education was responsible for handling the impact of the COVID-19 pandemic on the educational system. However, given the abovementioned economic and digital disparities, the measures undertaken by the Romanian state could not be uniformly implemented for the entire school population. Variations were created by the existing infrastructure, readiness and adaptability of teachers to embrace online schooling and deeper economic inequalities. For some children, this meant a complete hiatus from formal schooling.

The poor management of the COVID-19 crisis by the Ministry of Education (i.e., no coherent policy measures in the beginning of the crisis, cf. Forian & Țoc, 2020), left many teachers with little guidance on how to proceed and how to switch rapidly to a fully online teaching system. Furthermore, the low digitalisation of the Romanian population (both parents and children), especially reflected in urban/ rural disparities, meant that a transition to online teaching was not going to be an easy process.

In the beginning of the pandemic (spring 2020), the Ministry of Education did not take responsibility for ensuring free access for all children, even if 38 percent of children and young people younger than 16 reportedly struggled with precarious material conditions. Instead, in March 2020, the Ministry issued an order stating that parents had an obligation to ensure their children's participation in online classes, meaning they were responsible for ensuring infrastructure and equipment. Later in August 2020, the Romanian Government adopted an Emergency Ordinance (2020) to ensure access to mobile devices to underprivileged children, medical equipment for schools (i.e., masks, disinfectants), but also to ensure sanitary conditions for schools that were not connected to the public water and sewage system (meaning no running water for many schools in rural areas). Two major solutions (i.e., a portal for suggestions and resources for teachers and an online platform called Teleșcoala-Tele-school) were implemented, but with notable integration and uniformization issues.

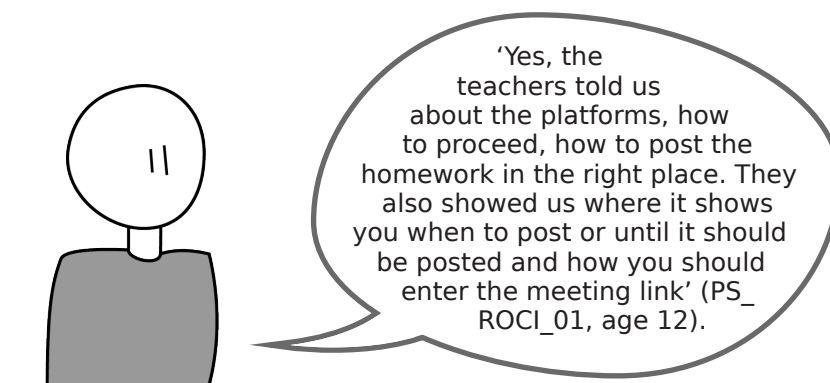
Finally, several international bodies active in Romania, such as Save the Children and UNICEF, have put forth strategies for planning and ensuring inclusive education for all children (UNICEF,

2020b).

Children's and young people's perspectives towards ICT access related to ICT use in Romania during the pandemic - first findings from the exploratory Pilot Study COVID-19 Add-On

Within the exploratory Pilot Study COVID-19 Add-On in the context of the European DigiGen project, three semi-structured interviews were conducted online with fifth and sixth graders (aged 11–12), and one interview with a ninth grader (aged 15), in order to assess children and young people's experiences and opinions about teaching and learning during the pandemic (see Chapter 4). The last interview, conducted with a young person aged 15, was added in order to also briefly capture the experiences of young people in the second school transition. The interviews were conducted online in Romania during the winter of 2020/2021, while the schools again entered hybrid or mixed learning scenarios, that is, green (in-person), yellow (mixed) or red (online only), according to the epidemiological risk level of each local community. However, like in the case with the Save the Children studies (2020), the interviews could not be conducted with children and young people in extreme poverty conditions, taking into account that any contact would have needed to be in-person, which would have increased the risks for already vulnerable communities.

From the respondents, all digital devices for school purposes were accessed at home. Whenever children and young people had hybrid classes (as reported to have been the case in the beginning of the pandemic), they would use physical books or booklets in school. No



'Yes, the teachers told us about the platforms, how to proceed, how to post the homework in the right place. They also showed us where it shows you when to post or until it should be posted and how you should enter the meeting link' (PS_ROCI_01, age 12).

child or young person reported the use of digital technologies when attending school in person. Children and young people were asked about their ICT access and use for school-related purposes. One of the children reported receiving a tablet from school; the rest of them reported either individual use of devices or shared use with other family members: '[I share a computer] with my mom. My dad and my sister have another laptop. And when my sister has classes, Dad picks up the phone. [...] Well, we also use the tablets from school, but if it's occupied by someone, we use our laptop or phone and that's about it' (PS_ROCI_03, age 11).

The exploratory study revealed other differences in the tools provided for learning, such as the use of learning management systems: some children reported using Classroom, Agora, Mozaik and Oxford, while the rest reported using Google Meets or Zoom. Although the children we interviewed reported that teachers were very involved in online education since the beginning of the pandemic, some also reported being given excessive homework, because, as reported by the Save the Children study, 'they have more free time now' (Save the Children, 2020). However, the participants reported being able to cope the best they could during the pandemic. 'Oh, [it was] easier [to keep up with learning] in a way. But, maybe harder, because they gave us a lot of homework' (PS_ROCI_03, age 11).

Participants stated they received the help and support of teachers, but talked about differences in the readiness of teachers to support children and young people with technical issues.

Finally, the experience of learning during the COVID-19 pandemic was reportedly challenging but at times also enjoyable for some who appreciated the efficiency of the online learning,

especially the ninth grader (aged 15) who was interviewed: 'Uh, I liked it the most, so to speak, the way everything went. We and the teachers learned new things. And besides, it seems a little easier that way with the lessons. I mean, stop looking for a hundred notebooks. You look for one, in a single Word file ... or that PowerPoint, as the teachers did' (PS_ROCI_04, age 15).

4. Cross-country Analysis

After providing an individual insight into the school situation during the COVID-19 pandemic in the period of the exploratory Pilot Study data collection in Estonia, Germany, Greece, Norway and Romania in Chapter 3 ('Country Profiles'), the present chapter focuses on the findings of the interviews with children and young people from the five abovementioned European countries referring to different aspects related to the use of ICT in education against the backdrop of the COVID-19 pandemic. The interviews were conducted between November 2020 and February 2021. This chapter covers five main topics, which are analysed across the five countries and relate to the following questions: (1) How do children and young people experience the use of ICT in teaching and learning during the COVID-19 pandemic? (See section 4.1); (2) How do children and young people perceive their own learning management during the COVID-19 pandemic? (See section 4.2); (3) How do children and young people experience the support in learning during the COVID-19 pandemic? (See section 4.3); (4) How do children and young people estimate their teachers' capacity and readiness to integrate ICT in teaching and to support the younger generation in preparing them adequately for the digital age? (See section 4.4); (5) How do children and young people perceive the impact of the COVID-19 pandemic on the use of ICT in education and related changes? (See section 4.5). These five main themes are derived from the categories of the qualitative content analysis, which were developed both deductively through the jointly developed semi-structured guide and inductively from the data material itself. The following five sections on the main themes provide common cross-national perspectives as well as distinctive individual findings from different participating European countries that are outlined and contrasted.

4.1 How do children and young people experience the use of ICT in teaching and learning during the COVID-19 pandemic?

This chapter focuses on children and young people's experiences of the use of ICT for teaching and learning during the COVID-19 pandemic. In this context, on the one hand, benefits regarding the use of ICT (see section 4.1.1) and on the other hand challenges and risks regarding the use of ICT (see section 4.1.2) from children and young people's perspectives are considered.

4.1.1 Benefits regarding the use of ICT

The results regarding the described benefits in the course of the use of ICT, from the children's and young people's point of view, present a broad picture. Overall, the results show that the children and young people across all five countries identify some advantages in the use of ICT. Moreover, children and young people in all participating European countries reported the accessibility of information as an important benefit in terms of using ICT for school-related purposes. In the following, individual results from the different participating European countries and joint perspectives across countries will be presented and also contrasted in more detail.

Accessibility of Information

Overall, children in Germany and Romania as well as young people in Estonia reported feeling more motivated through the use of ICT for school-related purposes and enjoyed working with learning apps. For example, one child

Motivation

from Germany describes benefits in using specific apps for tasks or assignments that could also increase children's motivation more than books could. Furthermore, in these three countries children and young people experienced benefits in that the use of ICT, such as tablet devices, enables them to be more independent and makes learning easier. Some children and young people interviewed in Germany and Romania explained that using ICT to learn at home provides more opportunities to figure things out by themselves, and that looking up information on the Internet and doing research makes it easier to complete school-related tasks because 'if there's something you don't know or aren't familiar with, you can just look on the Internet or search on Google' (PS_GECI_06).

By way of example and to illustrate the individuals' perspective, a child (aged 12) from Romania shared the experience of enjoying writing on the tablet and further stated that 'Just to feel like you're writing, but you're not writing on a piece of paper, you're writing on a screen, I think it's great!' (PS_ROCI_01). This view was echoed by an interviewee in Germany (aged 10), who reported enjoying writing on a tablet device and using it to learn in different subjects, and found it at times easier in comparison to paper.

In Estonia, children and young people reported that it is easier to concentrate and learn by online learning at home and that it is quieter in general than in class at school. Further, they even mentioned it as beneficial to be able to attend classes if they are online even when sick to avoid falling behind in learning. While in Estonia, an advantage can be noted in the flexibility of using ICT, for example in how to complete homework tasks, the aspect of flexibility was pointed out in Norway in another context, with one young person (aged 16) explaining the flexibility of group-working using video conference tools. With this, children were able to 'choose to work alone or if [they] wanted to work with [a] friend or with someone else in the class' (PS_NOCI_02) to complete assignments and therefore could still talk with and help each other. Children and young people in Germany also saw an advantage in being able to work alone or with a partner, especially through the use of breakout rooms in video conferencing, although this flexibility and opportunity of cooperative working is reported primarily by children from digitally advanced schools. A further advantage reported by only a small number of participants in Germany is teachers giving direct feedback by sending emails with helpful pictures or short learning videos in an attempt to make the learning content easier for the children to understand, which was a motivating factor for the children during the phases of reorganisation of school learning.

Independence and flexibility

Whereas in most participating European countries various benefits regarding the use of ICT for school-related purposes from the children and young people's point of view emerge from the interview data, no positive aspects were noted for Greece.

After this discussion in this section of the benefits regarding the use of ICT from the children's and young people's point of view, the following section focuses on the challenges and risks regarding the use of ICT.

4.1.2 Challenges and risks regarding the use of ICT

Divided into challenges and risks, this section provides an overview of the children and young people's experiences in the different participating countries. The analysis revealed a variety of children's experiences in terms of challenges and risks regarding the use of ICT, both within and among countries. However, it is emerging that there are common outcomes across the European countries.

Challenges regarding the use of ICT

Overall, the results indicate that there is a common view amongst the children and young people interviewed in all countries that keeping up with school content during the reorganisation of school learning is more difficult than keeping up with learning at school. Challenges were expressed in the distractions during learning offered by digital devices and installed apps, referring to social media platforms and games. Further, concerns were expressed in all participating countries about some children and young people having an even more difficult time learning and catching up during the phases of reorganisation of school learning than others. A number of different inhibitory factors posing challenges in using ICT for school-related purposes are indicated, including little or no access to digital devices and a lack of Internet connection as well as not being familiar with the use of ICT.

Little or no access to digital devices

Lack of Internet connection

Especially in Greece, access to devices and Internet connectivity are leading issues reported by children and young people in terms of challenges regarding ICT use for education during the pandemic. Interviewees in Greece (aged 13) reported attending classes where the majority do not have a computer and thus participate in online classes from their mobile phones where they can only use the online learning functions to a limited extent, or even miss online classes entirely. Online classes in Greece were perceived negatively by some children and young people interviewed due to a lack of connectivity. They also reported problems in dealing with the learning material, such as one participant (aged 13) in Greece mentioning that they 'couldn't communicate so well and many had problems with the connection' (PS_GRCI_05). Germany and Norway, however, access to devices was not as much of an issue; the relevance of a functioning Internet connection was, with connectivity problems reported by some of the interviewees as posing a challenge to the participation in online classes and increasing the danger of missing important information. In Estonia on the other hand, Internet connectivity was not a challenge in the reports of the children and young people.

Teachers being less approachable via ICT is recurrent theme in the interviews, especially in Estonia, Germany and Norway, resulting in children and young people waiting for answers to continue with learning or even being left on their own when they 'did not get the help that [they] perhaps had needed' (PS_NOCI_02, age 16). Especially in Norway, heightened levels of stress are highlighted by two out of four interviewees due to managing to work independently and having to complete assignments within a limited amount of time and turn them in by the given due dates (aged 15 and 16). In Estonia, too, children share this view of the challenges that come with growing independence, including the difficulty in keeping up with all the different apps to use for school-related purposes.

Teachers being less approachable via ICT

What emerged from the interviews in Germany related to the increased independence as a challenge coming along with ICT-based reorganisation of school learning was that there are disparities in the school's level of digitalisation. Children attending a digitally advanced school reported a regular school day in times of reorganisation of school learning, while participants from less digitally advanced schools reported that the reorganisation of school learning was less structured, with hardly any online teaching in the form of video conferencing and only little exchange with teachers.

Distraction strongly marked the messages of the interviewed children in Greece and Romania (aged 12), where it was explained that children, 'even if they have the best computer, [...] if they don't like to pay attention to the class. They close their net and play offline games'

Distractions during learning created by digital devices

(PS_ROCI_02). Further, in Estonia and Germany, individual participants expressed concern about the risk of ICT being a potential source of distraction, while in the accounts of the children and young people interviewed in Norway, this was not at all reported in relation to challenges.

In general, it was found that children and young people interviewed in the five European countries to a large extent addressed overarching common issues in the context of challenges and in the use of ICT for school-related purposes during the reorganisation of school learning in a pandemic, which were perceived with different intensities in the different countries

Risks regarding the use of ICT

Besides the challenges expressed by the children and young people, a variety of risks related to the use of ICT were also mentioned, which are discussed in more detail below.

From the interviews, it emerged that in each participating country, the majority of children and young people interviewed are aware that there are high risks regarding online safety, with an interviewee in Estonia stating 'you must try to be as careful as possible on the Internet' (PS_EECI_03, age 16). Interestingly, issues related to cyberbullying were not particularly prominent in the interview data, but only taken up by a few participants interviewed in Romania and Norway.

Online safety

Personal data protection

Concerns about compromised personal data, on the other hand, are more widespread within the interview data. Interviewees from Estonia, Germany, Greece and Romania reported that there is a risk of personal information and data being stolen and used for other purposes by strangers, whereas this was not an issue addressed by children and young people interviewed in Norway. In this context, it was pointed out, particularly by children and young people in Germany and Norway, that there is a great danger in accepting conditions and guidelines without having read them carefully, knowing what they contain and knowing what one has ultimately agreed to.

Commenting on risks related to the use of ICT, the importance of a strong password was particularly mentioned by interviewees in Estonia, Germany and Romania. Within this context, in Germany, Greece and Romania, the risk of strangers entering school-related video conferences was a recurrent theme. In particular, a child (aged 12) interviewed in Greece shared experiences of online classes being disturbed by strangers entering the video conference room and playing 'some weird songs' (PS_GRCI_03). An issue raised by participants in Estonia, Greece and Romania was the risk of digital devices getting a software problem or virus and important data then being deleted, whereas this aspect did not emerge from interview data in Germany and Norway.

Overall, the interviewed children and young people in the different countries showed a considerable sensitivity towards the risks of using ICT, especially with regard to online safety. The children and young people were generally aware of the risks and also emphasised that they had been taught this by the teachers and by their parents.

4.2 How do children and young people perceive their own learning management during the COVID-19 pandemic?

In this chapter, findings are outlined on children and young people's perceptions of managing learning during the COVID-19 pandemic. In the analysis of the interview data from all five participating countries, three major themes emerged, which will be presented in divided subsections: children's and young people's learning motivation (see section 4.2.1), their feelings

and mental health (see section 4.2.2) and self-regulation (see section 4.2.3) in the context of learning during the pandemic, in particular in relation to ICT-supported learning.

4.2.1 Motivation

It is striking that motivational aspects of the use of ICT for school-related purposes during the COVID 19 pandemic were not particularly prominent in the interview data across all five participating countries.

In relation to the use of ICT for school during the pandemic, rather demotivating effects were reported, which was most evident from the statements of the children and young people interviewed in Estonia (aged 16), with a majority of participants explicitly pointing to a 'constant decline of motivation' (PS_EECI_01) over time during the reorganisation of school learning phases due to the COVID-19 pandemic.

In Germany, however, the participants' (aged 10, 11 and 12) experiences with motivation in learning using ICT vary to some extent. Two of them (aged 10 and 12) reported learning apps to be motivating; more motivating than working with regular school books. Another interviewee explained that with teachers providing diverse digital material in the form of pictures and videos for better understanding, 'of course, it's more fun. Sometimes it's nice to have the motivation to work on it' (PS_GECI_05), while another participant stated that 'just sitting and doing it becomes boring at some point' and the motivation 'flew away' (PS_GECI_02).

Whereas interviews conducted with children and young people in Romania and in Norway do not reveal information regarding motivation in relation to learning using ICT during the pandemic, the view of a decrease in motivation is also echoed by a child (aged 12) interviewed in Greece, who alludes to the notion of chaos when describing his online course experience, referring to the hand-raising function in video conferencing tools. 'All this chaos with the hands' (PS_GRCI_03) and the resulting lack of communication becomes a demotivating factor for active participation in online learning sessions. Not only did this have a demotivating effect, but beyond that, according to the child, it also led to a feeling of being left behind in terms of learning, an issue that is further addressed in the following section dealing with the topic of feelings and mental health.

4.2.2 Feelings and mental health

In all five participating countries, a range of feelings was expressed by the children and young people interviewed. Although participants across all countries consider online distance learning to be a necessary measure in times of the pandemic and therefore appreciate it to some extent, varying feelings of less positivity are evident in all countries. In all countries, beyond the overarching issue of missing socialisation when meeting classmates, recurring reports of feelings indicate a prevailing general uncertainty and a common view amongst interviewees of online learning formats making learning more difficult than in-class learning at school. Interestingly, it is only in Estonia that a participant (aged 16) reported that one of their classes, Learning and Development, covered topics like stress, emotions and solving problems, while no information on schools addressing mental health and wellbeing is revealed in interview data from Germany, Greece, Norway or Romania.

Missing
socialisation

Concerns about being left behind due to online learning formats during the pandemic are issues especially reported by children and young people in Estonia and Greece as the following statement by an Estonian 10th grader (aged 16), who comments on having not enough online classes to understand

Feeling left
behind

the subject, indicates: 'I still feel as though I didn't really get to grips with some of the maths we did in 9th grade' (PS_EECI_03, age 16). The perceived lack of communication in distance learning, especially in online classes, and the fear of not being able to keep up with learning, is also reflected in the descriptions of a child interviewed in Greece (aged 13) reporting on the chaotic online classes, sometimes involving raising one's virtual hand for half an hour to actively participate. Although the issue of having to wait too long for answers during online classes because of the connection is also raised by one interviewee in Romania, the majority of children and young people interviewed in Romania reported keeping up well with the learning material and no concern was expressed about being left behind. Likewise, this concern is not prominent in the interview data from Norway and Germany.

Lack of communication

Commented on as stressors, particularly mentioned by children and young people interviewed in Greece, technical issues as well as lack of equipment are perceived as stress factors, such as having to hold a microphone on a headset due to it not working properly.

What is also perceived as tiring in Estonia, Germany, Greece and Romania is 'to sit in front of a screen all day' (PS_ROCI_03, age 11). In Estonia, some participants shared a feeling of laziness and loss of energy due to a lack of routine in their everyday school life. Individual participants in Germany as well as in Greece report not only tiredness but also the occurrence of headaches in relation to extended screen time and also the use of headsets for school-related purposes.

Among respondents in Romania, Germany and Norway, a feeling of being overwhelmed was reported. While an interviewee in Romania reported being stressed and overwhelmed by all of the online work in multiple subjects, another interviewee in Germany pointed out the feeling of stress and being overwhelmed when there are different apps to use, resulting in children having 'to look back and forth to find out which information is available where' (PS_GECI_03). In Norway, the feeling of being overwhelmed primarily derives from a greater sense of responsibility and self-organisation than when being physically at school, resulting in more stress and less energy.

Overload of online learning: stressor, less energy

Furthermore, in Norway, a feeling of tiredness is reported by an interviewee as a consequence of having 'to take care of everything in a way' (PS_NOCI_01, age 15). This feeling also emerges from interviews conducted with young people in Estonia who reported having more responsibility—more than when at school—being required to keep an eye on the time and thus feeling more stressed due to keeping deadlines to upload assignments as well as having more homework in general. These aspects were not reported as stressful by children and young people interviewed in Germany, Greece and Romania.

4.2.3 Self-regulation

In the analysis of interview data from all participating countries, self-regulation emerges as an important aspect when it comes to learning management. Different issues of self-regulation in learning using ICT during the pandemic recurred throughout the datasets across all countries.

Some children and young people in Estonia, Germany, Greece and Norway reported distance learning using ICT during the pandemic to be more time consuming and demanding more self-organisation than in-class teaching and learning, whereas in Romania only one participant reported an increase in time taken for school due to getting more homework. Commenting on learning management, interviewees in Estonia and Germany reported setting up their own time schedules for learning, homework and free time. A young person (aged 15) interviewed in Norway stated that it was difficult at first to know what to do, not having a detailed weekly

schedule, but over time meetings were scheduled on a more regular basis and children and young people were no longer left alone with tasks. Similar reports of self-generated learning schedules do not emerge from the interviews conducted in Greece and Romania.

Individual time schedules

In Romania and Greece, participants reported an increased use of digital technologies due to the re-organisation of school learning. However, there is a significant difference in that the child (aged 13) in Greece feels stuck using too much digital media, whereas the young person (aged 15) in Romania shares the experience of using digital technologies more efficiently and dividing screen time into school work and leisure time. Reports that ICT-supported learning during the pandemic has led to a more efficient and reflective use of digital technologies emerge only from the interview in Romania.

More efficient and reflective use of digital technologies

Altogether, the interviews in all countries revealed that the three sub-categories of Motivation, Feelings and Mental Health, and Self-regulation are vital in terms of learning management in the time of the COVID-19 pandemic. Within these subcategories, findings partly overlapped for some countries, with some more pronounced variations and specific details that were highlighted.

4.3 How do children and young people experience the support in learning during the COVID-19 pandemic?

This chapter focuses on children and young people's experiences with support in learning during the COVID-19 pandemic. In this context, experiences regarding, on the one hand, support with learning issues (see section 4.3.1) and on the other hand, support with technical issues (see section 4.3.2) from children and young people's perspectives are considered.

4.3.1 Learning issues

The following section refers to the experience of support regarding learning issues from the perspective of the children and young people. The results are presented separately according to support from family members, teachers and peers.

Family members

Across all five participating countries, support from family members was considered vital to the participants' learning success, especially during the COVID-19 pandemic. Most children and young people interviewed across all countries mainly received support with learning for all or just specific subjects from parents, stepparents or foster parents and/or siblings. Some received help from grandparents and/or cousins either in general or with certain subjects.

In Romania, support was somewhat evenly divided between parents or stepparents, although in Germany mothers supported their children in learning slightly more. In Estonia, half of the interviewed children were supported mainly by their fathers while the other half received support from both parents. Support given to interviewed children in Greece and Norway was evenly divided between parents or guardians, siblings, grandparents and/or cousins. Two children (both age 12) in Germany reportedly only asked their parents for help at times when they preferred not to wait for responses from their teachers.

Family members' support with learning was in general extensive and provided in the form

of helping studying for tests, reading texts, explaining topics and working on schoolwork or homework together. A few notable details from interviews were that, for example, a child (aged 10) in Germany reported their mother printing out worksheets sent from the child's school at her place of work to bring home for the child to fill out. Some children in Greece and Norway reported needing and receiving extra help specifically in maths by either a family member or a tutor, while another child (aged 12) in Greece stated they 'better understand with a teacher' (PS_GRCI_02) in person than through support received by their family members at home.

Interestingly, two participants in Norway (both aged 16) remarked on how other children and young people with lack of support from family members and who perhaps mainly rely on help from classmates 'had to work even more and may not get to all the school work' (PS_NOCI_04) and would therefore continue to have difficulties when they are back at school writing tests, etc.

Peers

Overall, it can be noted that the children and young people in all five European countries supported each other with regard to learning issues.

Especially in Estonia, it is evident that the children and young people supported each other. One participant stated that they were in constant contact with their classmates and they were always seeking and providing help amongst each other with learning issues. They had a group on social media where they could write to each other or ask each other for help individually. Another young person reported that after online lessons in a video call, the classmates called each other, chatted and did homework together. They also had contact with children and young people from other schools and received help from each other.

A similar picture of peer support among children in Germany, Greece and Romania is found. Here, too, children and young people have supported each other and used different applications to chat and make video calls with friends either from class or from another school to help each other with schoolwork and to do assignments together. However, regarding the aspect of peer support being less prominent in interview data from Norway, one young person (aged 16) reported that 'the class group was much more active during that pandemic than otherwise' and explained this with the fact that 'we were dependent on each other' (PS_NOCI_02).

Teachers

Responses to how much teachers helped the interviewees with learning during the COVID-19 pandemic and the reorganisation of school learning varied greatly. Some children and young people reported receiving abundant help from their teachers, like getting questions answered right away, and also noticed that their teachers worked very hard to help them, whereas other participants reported receiving little information or instruction from their teachers on how to complete assignments and felt that opportunities to ask questions were lacking.

A child from Greece (aged 13) and the majority of participating children and young people in Romania (aged 12, 15) reported they were very satisfied with how teachers supported them during the pandemic. Further, in Norway one participant (aged 16) stated 'most people were actually quite committed to helping us' (PS_NOCI_03), while another young person (aged 16) reported receiving little help with learning from teachers in the beginning, but that this improved over time. However, some participants (aged 10, 11 and 12) in Germany reported they 'didn't like online learning as much as the normal lessons because teachers don't explain properly on the pieces of paper how it should be done' (PS_GECI_01). In Estonia one participant (aged 16) shared the experience that the teachers 'were definitely there, but I think they could've been more helpful' (PS_EECI_03).

By way of examples some children and young people in Estonia, Germany, Greece and Norway reported receiving quick answers and instructional videos from their teachers via email or message whereas some had to wait a long time for a response when they had questions about the homework or lesson. A child in Germany (aged 12) reported that 'there are also teachers who really want [them] to understand it well and to be able to work on something good' (PS_GECI_05) and who would also send emails with instructional videos and pictures to aid in learning and answer their questions via email right away. A participant in Germany (aged 12) said they could, in addition to writing, as was common for most participants in Germany, also call their teachers if they had questions. Furthermore, a participant (aged 15) from Romania reported that they 'received the materials, the teachers explained the classes' (PS_ROCI_04) online. In Estonia, some of the young people explained that they could ask in video conferences if they needed help or had any problems. Another participant (aged 16) from Estonia reported that people could contact their teacher and 'always had the opportunity to ask them something privately' (PS_EECI_03).

However, some children and young people reported having difficulties getting help from teachers through writing emails and messages. Two participants in Norway (both aged 16) and one child in Germany (aged 11) reported that it is difficult to get help when they need it due to having to wait for responses from their teachers, which they attribute to their teachers having to help many other children. However, another child (aged 12) interviewed in Germany stated that their teacher held a video conference once in which the children and young people could ask questions. The issue of lack of communication was also echoed by a participant (aged 16) in Norway, reporting they had to 'calculate a lot of time before you got time from the teacher' and further added stated 'classmates were really my teachers in a way' (PS_NOCI_02).

A participant in Norway (aged 16) stated that their teacher explains things to the children and young people using Microsoft Teams. In Greece, a participant (aged 12) reported that teachers also sometimes repeat things in case something was unclear during online classes; however, when having additional questions towards the end of the lesson, teachers and classmates 'immediately leave the link when the lesson ends' (PS_GRCI_02) and the participant describes feeling as if questions should no longer be asked.

4.3.2 Technical issues

The following section refers to support in the context of technical issues experienced by children and young people during teaching and learning in times of a pandemic. Again, the results are divided into support from family members, teachers and peers.

Family members

While the children and young people in Estonia, Greece, Norway and Romania reported having received support regarding technical issues from family members, there are no reports of experiences on the side of the children and young people from Germany.

For example, one participant in Norway reports that their mother offered them help when there were problems with the microphone used for the video conferences. Another participant said that their father helped when there were Internet problems and their father helped to log back into the online class. A participant from Estonia reported that support from their father would have been there if help had been needed, as the father is familiar with computers and technology. However, there was no situation where the child needed help. While one child (aged 12) in Greece also reported that both their mother and siblings were supportive with technical problems, two other participants commented about not needing any support with technical issues and solving them all by themselves.

In Romania, most of the participants proved to be very independent when faced with technical issues following a 'learning by doing' approach. Some children completed the installation of applications, created an account and learned how to use various technologies by themselves. One participant (aged 12) reported that at the beginning when they started using video conference tools for school, the stepfather helped because the participant did not have their own digital devices to use for video conferences.

Peers

In terms of support from peers in relation to technical issues, the picture is very bleak. Only children and young people from Romania and Norway reported experiences in this regard, while in Estonia, Greece and Germany no relevant experiences were shared.

By way of example and to illustrate the individuals' experiences in Norway, one participant (aged 16) reported helping their classmates with microphone issues after consulting their mother to show how to fix it first. In Romania, a similar picture emerges, as participants 'taught each other and we even use more applications more easily' (PS_ROCI_04) and supported via chatting on messaging apps or calling in case of technical issues.

Teachers

Overall, it appears that teachers in Estonia, Greece, Germany and Romania supported the children and young people with technical issues. For Norway, no experiences of teacher support with technical issues emerge from the interview data.

In Greece, one child stated that their teachers sent emails via learning management systems about applications they needed to download and install for classes online, which are perceived as being very easy to use. Their IT teacher helped them with all of these and how to use them. In Romania, too, the teachers informed the children and young people about platforms and how to find information like due dates entered in the learning management system, how to submit the homework and how to enter meetings via link. Some teachers also helped the children and young people with technical issues related to video conferences like adjusting the camera and microphone settings if they were not working. By contrast, a participant (aged 12) in Romania reported not having received much help at all from teachers regarding technical issues and that some clues from teachers 'weren't really that good' (PS_ROCI_01).

One participant (aged 16) from Estonia explained that they received a quick introductory overview of the sites and that the teachers 'gave a quick overview of how to use them' (PS_EECI_03) in primary school. However, these young people think that such an overview would not really be necessary for them because young people 'know what to do' when they are given login information and the site. If they did need help with technical issues, they could ask their technology teacher. Participants in Germany as well reported that they had an introductory lesson in the school's computer room on how to use the learning management system. Other participants reported that, in order to learn how to use the learning management system, they had the opportunity to join online lessons and further to receive screenshots and videos with explanations from teachers. One child from Germany stated that they received help from their teachers regarding technical issues such as the teachers answering questions thoroughly.

Overall, it was found that in all countries, parental support in learning is essential for children and young people. Parents appear to be an important source of help in learning during the pandemic, in particular with technical difficulties, in four of the five countries. Participants' experiences of teachers supporting in learning during the pandemic varied across the countries from teachers whose instructions and tasks are not understandable, accompanied with a lack of communication, to teachers providing the opportunity to write and call in case of questions and

offer supportive pictures and videos to help learning. Regarding teacher support in technical issues, in almost all participating countries, children's overall satisfaction predominates. With regard to peer support, it can be said that two out of five participating countries' results indicate it can be a source of help for issues, both in terms of learning and technology, but not as extensive as the support from parents, whereas in other countries there is no evidence of this at all.

4.4 How do children and young people estimate their teachers' capacity and readiness to integrate ICT in teaching and to support the younger generation in preparing them adequately for the digital age?

This chapter deals with the estimation of children and young people with regard to the digital competences of their teachers and to the teachers' willingness to integrate ICT into teaching. In a first step, the focus is given to the teacher's willingness to integrate ICT in education (see section 4.4.1). Afterwards, the teachers' competences regarding the use of ICT will be addressed (see section 4.4.2).

4.4.1 Teachers' willingness to integrate ICT in education

With regard to the evaluation of the teachers' willingness to integrate ICT into teaching, a picture emerges of diverse experiences. For example, children and young people from Greece and Romania reported feeling that their teachers prefer classroom teaching more than online learning. However, another participant (aged 12) interviewed in Romania shared the impression that the teachers would have realised that they will need the digital technology not only during this period of the COVID-19 pandemic, but beyond and that the teachers are trying to develop their digital skills. Another participant (aged 15) from Romania and a child (aged 12) from Germany mentioned that the teachers were supportive during the pandemic and they put significant effort into providing a consistent and effective learning environment.

However, findings across all participating countries point to quite a few teachers not being prepared well due to a lack of digital skills and still needing help from school children and young people when it comes to the use of digital technology. A participant (aged 15) from Romania describes the situation in such a way that many things seem new and accordingly the teachers 'learned with us' (PS_ROCI_04). In addition, this interviewee shared the experience that there has been a great change in how teachers use digital technologies, from hardly using them before to using them daily for all sorts of school-related activities: 'Before, they didn't use them much, that is, almost not at all; they only gave a phone call or a message and now they use them daily, for hours, for all the minor things' (PS_ROCI_04).

In contrast to the impressions from Romania, where a child (aged 12) reported that their teachers are motivated to use digital media even beyond COVID-19, although they are still struggling with using them, a participant (aged 16) from Norway noticed a huge difference between the beginning of the lockdown and the end. While at the beginning of the pandemic the teachers were 'very helpful and proactive' (PS_NOCI_02), they have recently lost their motivation. In Greece as well, one participant (aged 13) reported that the teachers tried very hard, especially in the first lockdown, but that they were sometimes not prepared enough and therefore had difficulties, which was also partly due to the connection. In the second lockdown phase, things worked better.

Referring to the use of ICT during in-class teaching at school, a child (aged 12) in Germany who

attends a digitally advanced school reports that the teachers sometimes use digital technology (e.g., an interactive whiteboard), but due to the fact that it requires more effort and time to use, the teachers would rather use a normal whiteboard because of its lower complexity. In Estonia, too, the children and young people see that the teachers are also able to acquire new knowledge because of the new situation. This also creates new opportunities for children and young people who cannot go to school (e.g., because they are sick) to be given the opportunity by the teachers to attend the lessons via video conference.

After presenting findings on the teachers' willingness to integrate ICT in education from the children's and young people's point of view in this section, the following section deals with the children's and young people's assessments of teachers' digital competences regarding the use of ICT.

4.4.2 Teacher's competences regarding the use of ICT

With regard to the evaluation of teachers' competences in using ICT in education from the perspective of children and young people, the overall picture is very similar in all five European countries.

Overall, the children and young people in Estonia, Germany, Greece, Norway and Romania report that there are teachers who are very familiar and competent with the use of digital technologies as well as teachers who struggle with them. Especially in Greece and Romania, children and young people experienced teachers having problems with the use of digital technologies during the reorganisation of school learning, particularly regarding the use of video conferencing tools. Teachers were not able to handle the applications or had problems turning on the microphone or the camera. The children and young people then had to help the teachers. Due to the technical problems, some of the time was wasted in lessons. In Germany, some children and young people report similar problems as in Greece and Romania: 'There are some teachers who aren't so familiar with technology and don't understand it that well themselves' (PS_GECI_05). In Estonia in particular, one participant (aged 16) reports that 'the teachers had to learn a lot' (PS_EECI_03) and that they became better at using digital media over time. This view was also echoed by a child interviewed in Germany reporting that teachers became more familiar with apps new to them. In this context, a participant (aged 16) in Norway reported that there were some teachers who did not know how to use digital technologies at the beginning, but thus some of them were given a short introduction to develop their skills.

Especially in Estonia, Greece and Norway, children and young people attributed the teachers' age to their use of ICT. In this context, a participant (aged 16) from Norway comments that 'there is a huge difference between those who are a bit older and those who are a bit younger' and beyond that states that 'It's different from teacher to teacher' (PS_NOCI_02), referring to teachers of different subjects. This participant even reinforces the statement by sharing the estimation that children and young people are better at using digital media than teachers. This perception is also reflected in the interview data from Estonia, with one participant stating that 'School definitely made progress (...) in the digital world. Because lots of the older teachers had to learn how to use a computer' (PS_EECI_03, age 16). Teachers in general have had to come up with solutions to deal with the situation.

Overall, differences in the willingness and competence of teachers to integrate ICT into teaching are perceived by children and young people in all countries, and remarkably these differences are frequently associated with the age of the teacher. However, there is a common perception that in every country there are teachers whose digital literacy and willingness to engage in digital teaching is considered to be lacking.

4.5 How do children and young people perceive the impact of the COVID-19 pandemic on the use of ICT in education and related changes?

This chapter addresses the impact of the COVID-19 pandemic on the use of ICT in education as perceived by children and young people and the changes associated with it. First, considering long-term effects, it will be evaluated how much children and young people have developed new skills in using ICT in the school context during the COVID-19 pandemic. In this context, attention will also be paid to whether their attitudes towards the use of ICT for school-related purposes have changed (see section 4.5.1). This will be followed by insights into what significant changes children and young people in the different countries have specifically perceived with regard to ICT use in education and, above all, to what extent they expect sustainable, lasting changes in everyday school life to occur (see section 4.5.2). Finally, the chapter closes by addressing the wishes that children and young people express with regard to the use of ICT in education (see section 4.5.3).

4.5.1 Development of ICT-related skills and changes in attitudes towards ICT in education

From the interview data across four participating countries, Estonia, Germany, Greece and Romania, it appears that newly acquired and further developed ICT-related skills are primarily related to working with learning management systems, whereas participants in Norway did not report on gaining or expanding ICT-related skills against the backdrop of COVID-19-related changes in schooling.

Differences are particularly evident when examining Estonian participants (aged 16), who reported that they were already familiar with both learning management systems and video conferencing tools and only expanded their knowledge, while in Germany and Greece some children (aged 11 and 12) only had their first experience with learning management systems as a result of the reorganisation of school learning due to the pandemic and had only limited involvement with video conferencing. Only a small number of those children interviewed in Germany reported having been familiar with working with digital devices for school and particularly learning management systems before the COVID-19 pandemic. This applies primarily to children and young people attending tablet-based classes or even attending a digitally advanced school. Some of the participants in Germany have emphasised having learned how to use the Internet, both in terms of research and in terms of online security and handling of personal data.

Commenting on ICT-related skills developed in the school context during the COVID-19 pandemic, one of the interviewees in Greece (aged 13) reported becoming 'more familiar with the use of computers' and beyond that also reflects that they are 'sure that this will be proven useful in the future' (PS_GRCI_05). This view was echoed by a participant (aged 15) interviewed in Romania who reported having developed skills especially in PowerPoint and Excel as essential for future employability. These kinds of further conclusions do not emerge from the interview data from Estonia, Germany and Norway.

In terms of changes in attitude towards the use of ICT, young people in Estonia became more reflective on their use of ICT and one interviewee (aged 16) noticed that the increased digital work for school during the pandemic 'led to a greater need to take more breaks and spend more time outdoors' (PS_EECI_02) and even reported tracking their screen time a day.

While in Germany, Greece and Norway no specific information on a change of attitudes toward

the use of ICT in education emerged from the interview data, in Norway participants experienced increased awareness of the importance of accessibility to digital devices and in particular to a good Internet connection.

4.5.2 Expected sustainable and lasting changes in the use of ICT in everyday school life against the backdrop of the COVID-19 pandemic

A variety of perspectives were expressed across countries regarding the changes in ICT use in the classroom that have occurred during the COVID-19 pandemic period and the children's and young people's assessments of what changes remain in the long term.

Young people interviewed in Estonia reported two main measures used to manage the risk of COVID 19 and ensure that education can still be provided. Alongside alternating days, where some young people are physically at school while others watch the lessons via live video and do the assignments, it was mainly the approach of hybrid lessons that was reported, referring to lessons experienced during periods where contact-lessons were allowed, but some of the young people were not able to participate (e.g., due to self-isolation because of COVID-19 contact). One participant (aged 16) stated that hybrid lessons have become more common and assumes they will be continuously implemented in future everyday school life and that homework in digital formats will also be implemented. In Norway, another participant (aged 16) stated online learning is an option for future instances when children and young people are unable to be physically present at school. Further, in Greece, anticipated sustainable changes refer to online learning; not to online classes, but generally to the use of the Internet being part of teaching and learning even when returning to face-to-face teaching and learning.

In Romania, opinions differ as to whether everyday school life will change with regard to long-term ICT use. While one participant (aged 12) assumes that everyday school life will change '100%' (PS_ROCI_02) in the long term due to the COVID-19 pandemic, another participant (aged 12), on the other hand, does not expect any changes to remain or occur except for the switch to digital textbooks on their tablets.

4.5.3 Desires for change in the use of ICT in education

As shown in section 4.5.2, participants across four of the five participating countries reported to have developed new and further ICT-related skills in schooling during the COVID-19 pandemic. However, participants in all countries still express desires for changes in this context, varying across countries.

The wish 'that teachers are more responsive' (PS_GECI_04) is particularly prominent in the interview data of Germany and Romania. A desired improvement of communication with teachers is also expressed by an interviewee (aged 16) in Estonia, particularly referring to the wish for more video conferences. Regarding teachers, some children and young people in Germany as well as in Norway expressed the desire for teachers to improve their digital skills in general.

Teachers being more responsive (via ICT)

The desire for accessibility of digital devices and good Internet connection recurred throughout interviews conducted in Estonia, Greece and Romania. By way of example and to illustrate the individuals' perspective, a child (aged 13) from Greece stated: 'It should be not so difficult for some children to connect to the Internet and not lose connection so easily' (PS_GRCI_01).

Beyond wishing for digital technology of all kinds to 'become more accessible' (PS_EECI_03) for everybody, one participant (aged 16) in Estonia further expressed the wish to keep hybrid lessons in the future, arguing that especially in secondary school, missing a day means missing much learning, and with hybrid lessons the possibility is provided to participate online if necessary. Further, in Estonia, one participant (aged 16) expressed the wish for assignments submitted online during distance learning to be designed to be easier to understand, as understanding and working on them was difficult for him due to a language barrier.

Good internet connection for everyone

Accessibility of digital devices

Overall, the results indicate that children and young people across all countries had to work more with digital technologies for school-related purposes due to the changes caused by the COVID-19 pandemic and thus for the most part were able to (further) develop their ICT related skills. Some of the participants also reported that they have become more reflective with regard to the use of ICT. In terms of changes considered to be long-term, children and young people stated to anticipate that the new situation (in relation to distance learning or hybrid learning) will also be part of everyday school life in the future and that they can also imagine that learning and teaching will become more digital in the future in general. Due to changes caused by the COVID-19 pandemic in everyday school life, the children and young people expressed some wishes, for example that digital technologies become more accessible and, furthermore, that teachers become more competent in the use of digital technology.

More effective and reflective use of digital technologies

5. Summary and conclusion of the exploratory Pilot Study COVID-19 Add-On

The exploratory Pilot Study COVID-19 Add-On was designed (1) to get insights into children and young people's reflections and perceptions on the use of ICT in education during the COVID-19 pandemic, involving them as co-researchers and (2) to be used as a tool to further adjust and develop the instrument to conduct the main study on 'ICT in education'. The main study, paying particular attention to transition phases from primary level into secondary level will involve following children and young people over a longer period of time and developing narratives of their ICT experiences in education, and engaging them as co-designers and co-producers of these narratives as part of the collaborative ethnographic approach. In keeping with this approach, findings of the exploratory Pilot Study feed into further development of the interview guidelines for children and young people interviewed from spring to winter 2021.

This chapter offers a summary of key findings from the exploratory Pilot Study COVID-19 Add-On for each participating country in section 5.1. In section 5.2, a brief conclusion of the exploratory Pilot Study COVID-19 Add-On is provided by deriving possible implications and impulses for further research in WP5 and for educational research and school development.

5.1 Summary of the exploratory Pilot Study COVID-19 Add-On

The goal of the Pilot Study was to assess how children and young people reflect on their experiences with ICT in education during the COVID-19 pandemic. It was also extremely important to the researchers to capture knowledge on children's and young people's perceptions of the effects of the pandemic on their school education and experiences with ICT during that time. Another major goal of the Pilot Study was to gather information to be used to modify the instrument for the main study under WP5 in the context of DigiGen.

To reach the goals for the Pilot Study, a methodological approach was developed involving a qualitative research design. The qualitative research design was chosen with the purpose of achieving a collection of children's and young people's reflections on the topic of ICT in education against the backdrop of the COVID-19 pandemic and its effects on the younger generation's school lives in five European countries (Estonia, Germany, Greece, Norway and Romania) using open-ended questions and allowing the participants to share what they experienced.

In the sample, a total of 26 school-aged children and young people attending the first or second school year after the transition from primary to secondary education⁵, the time of which varied across the five European countries, were interviewed. Due to the transition time varying among the different countries, the participants were of different ages ranging between 10 and 16 years old. The sample also included children and young people with various background characteristics such as gender, migration background and socio-economic status.

Following the methodological approach presented in Chapter 2, in Chapter 3, country profiles for each country that was involved in the Pilot Study are presented in which country-specific information relevant to the study and selected results for each country are provided.

The following section provides a summary of the key findings for the individual participating

⁵ With the exception of Estonia, where young people were interviewed at grade nine, i.e. directly before the transition to secondary level, due to convenience sampling and the timing in the school year.

countries.

In Estonia, where the transition to digital solutions for schools, that is, distance learning, was the smoothest at the outbreak of the pandemic, it was found that among the four ninth grade (aged 16) participants, there were no significant issues regarding the use of or access to digital devices; however, challenges still arose. The participants overall were bothered by having to switch between different platforms and applications for different teachers and classes and would have preferred more uniform solutions. Young people also struggled to maintain their motivation for learning during distance learning periods, despite having essentially nearly everything they needed for it. In addition, there were some families and young people without the digital devices necessary for distance learning; these were then provided by local governments or community initiatives in Estonia.

In Germany, among the eight fifth and sixth graders (aged 10–12) who participated in the study, some attending digitally advanced schools and others attending schools that were far less digitally prepared, especially for the first sudden shift to reorganisation of school learning, the results from the study vary greatly. In the interviews, which were conducted during the second school shutdown in Germany, some children and young people reported having been provided with digital devices by their schools while others were left having to organise their own digital devices or borrow one from someone in their household. In addition, learning material and activities were provided in various ways; for children and young people at less digitally advanced schools, parents/guardians were at times having to print material out (e.g., at their workplace) for their child to fill out by hand. According to the children's and young people's experiences at digitally advanced schools, on the other hand, the challenging situation of shifting to reorganisation of school learning went more smoothly because the necessary equipment and familiarity with the hardware and software were already there. Funds from 'Digitalpakt Schule' (Digital Pact for Schools) for digital devices for disadvantaged children and young people and teachers were increased to aid schools in the reorganisation of lessons during the pandemic. At the onset of the second school shutdown in December 2020, schools, teachers and children and young people were generally better prepared for the reorganisation of school learning and working via digital means due to the experiences and lessons learned in the first school shutdown. Some schools adopted their first online platforms for school children and young people when the second shutdown took place, which then contributed to more children and young people gaining more experience with digital technologies. One challenge emerging from the interview data is getting the digitally less advanced schools up to speed with the digitally advanced schools and reducing these gaps.

In Greece, five interviews were conducted with seventh and eighth graders (aged 12–13). The interview data from Greece is dominated by statements about the challenges of ICT in education during COVID 19. It emerged from the interview data that the overall assessment of the reorganisation of the school learning experience posed various challenges; access to devices and Internet connectivity especially are leading issues reported by children and young people. Throughout interviews conducted in Greece, the desire for accessibility of digital devices and good Internet connectivity recurred. Differences were reported in the readiness of schools to reorganise school learning and distinct differences perceived between the different phases of the pandemic were reported, indicating that schools were developing and adapting over time. Teachers were reported to differ in terms of willingness and competence to integrate ICT in teaching. While some are very familiar and competent in the use of digital technologies, others struggle with it. Another aspect of challenges related to ICT in education during the pandemic that is evident from the data is technical problems that interfered with synchronous education at both ends for both children and teachers, especially in cases of socio-economic inequality. However, children also reported having gained experience in the use of ICT during the pandemic. The positive impact on the acquisition and/or enhancement of digital skills reported by participants is followed by a feeling of fatigue resulting from the extended use and the

time spent in front of the screen, related to the reorganisation of school learning. Among such aspects, relevant for mental health, is also the issue of a blurred distinction between (home) work and free time, as children experienced work overload that resulted in less free time. Family members' support with learning and technical issues appeared to be an important source of help, but also peers helping each other. Teachers were reported to be supportive in learning and technical issues as well, yet unfortunately they were not always easily approachable in the reorganisation of school learning.

In Norway, five interviews were conducted with children and young people in the age group of 13–16 years; children who were transitioning from primary to secondary school and young people transitioning from secondary school to upper secondary school. A key finding from across the interviews was that each of the participants had a laptop or tablet provided by their school. Thus, access to devices was not as much of an issue; instead the relevance of a functioning Internet connection was, and some of the participants experienced connectivity problems posing a challenge to the participation in online classes and increasing the risk of missing important information. Support in terms of learning issues in Norway primarily referred to family members, as with technical issues. Further, peers were reported as being a source of support in learning and in technical issues, whereas no support in terms of technical issues by teachers was reported, only in learning issues. Participants shared experiences of teachers at first not knowing how to use digital technologies but developing their skills over time as a result of COVID-19. Thus, participants in Norway expressed the desire for some teachers to improve their digital skills in general, and furthermore, be more approachable via ICT in school learning. The reorganisation of school learning using ICT during the pandemic was perceived to be more time-consuming and demanding more self-organisation than in-class teaching and learning, which was reported to be challenging and leading to heightened levels of stress.

In Romania, three interviews were conducted with fifth and sixth graders (aged 11–12). Additionally, one interview was held with a ninth grader (aged 15). All children and young people interviewed reported only having used digital devices for school at home and not in school, whereas, prior to the pandemic, they usually used physical books. Out of all four participants in Romania, one child reported having received a tablet from their school while the others used or shared digital devices at home. While the help and support of teachers in terms of working with digital technologies is present and was especially seen in the sudden shift to online learning during the school shutdowns in Romania, access to digital devices, particularly for children and young people at-risk, remains an issue. Overall, the children and young people interviewed reported being able to cope with the new learning situation, though keeping up with homework was a struggle.

5.2 Conclusion of the exploratory Pilot Study COVID-19 Add-On

Overall, this study strengthens the idea that children and young people in Europe face different challenges in terms of ICT use in education during the pandemic period, however, progress has been observed in each country. Children and young people in all countries have voiced various wishes including easy access to digital devices and especially the internet for everyone, as well as the desire for teachers to be more digitally competent, once again highlighting existing challenges of varying degrees in some countries clearly perceived by children and young people.

This chapter provides an outlook and an overview of the possible implications of the research findings structured in four different areas:



The following implications emerging from the research findings of the exploratory Pilot Study COVID-19 Add-On on 'ICT in education', to be understood on a European level, have been categorised according to the abovementioned areas and will be further specified as follows.

Implications for DigiGen's research and research design development

The findings of this research indicate the need for future research to pay closer attention to digital inequalities, which might have been deepened by the impact of the COVID-19 pandemic on education. Drawing from the findings across Europe, the risk is apparent that the COVID-19 pandemic had such an impact, in that those who were digitally well off adapted to the new conditions of the reorganisation of school learning based on ICT, while those already living in precarious circumstances became further disengaged. Although the results showed differences within as well as among countries in terms of the situation regarding the level of progress in the use of ICT in education, across Europe, and even in more advanced countries such as Estonia, there are still vulnerable groups among children and young people who do not cope well with the reorganisation of school learning using ICT. These vulnerable groups should be identified by further investigating the risk factors causing vulnerability, aiming to contribute to designing interventions to be tested in order to determine how to best support vulnerable children and young people. A comparison between those children and young people who liked and disliked distance learning during COVID-19 would also be a significant topic for further research addressing the following questions: What are the main reasons for this difference in attitude? What are the main determinants (facilitating factors and obstacles)?

As another predominant finding from the data, some children and young people report feeling distracted when they have to work with a digital device for school at home and therefore sometimes prefer to work on paper rather than on a digital device because they feel they can concentrate better. To explore this emerging aspect further and find possible correlations and explanations, more in-depth research is needed to better understand children and young people in this respect and to be able to address such risks and challenges they face in the use of ICT for school.

Overall, the insights gained from the interviews with children and young people from five European countries into their everyday school life during the pandemic lead to the general remark that it would be valuable to build on this with a qualitative research project where children and young people are involved as co-creators, for example, addressing the following

research question: If a young person could design a learning programme himself/herself, then how would he/she design it (features, contact learning, distance learning, hybrid learning)?

Implications for researching ICT in education

Particularly against the backdrop of COVID-19 and its massive impact on education, future educational research on the topic of ICT in the school context should pay closer attention to how digital learning was actually implemented, specifically in countries such as Romania, where many schools and teachers had to undergo a 'forced' digitalisation, with various levels of skills, tools and support at their disposal. It is also important to further investigate how different digital competences were acquired by teachers and children and young people in the context of 'forced' or rapid digitalisation (e.g., formal/informal, in school/outside of school) in order to optimally assess the needs for further support/competence development.

The experience of the pandemic might have had an impact on the ways children and young people perceive the role of ICT in education. The 'digital condition' seems to have become expected for children and young people, who seem to be adjusted; the question remains open for teachers and educators, so future research could focus on their adaptability.

Better understanding is also needed about teachers' knowledge, competences and attitudes to determine what the main reasons for their readiness to integrate ICT into their teaching work are. Teachers' digital competence and how they incorporate ICT into lessons play a tremendous role in the development of children's and young people's digital competence acquisition. In that context, another question is how teacher training, particularly involving ICT, will change now due to the experiences of schools and children and young people since the onset of the COVID-19 pandemic. Further research should investigate whether the alternation between days learning at school and days learning from home is beneficial for students' learning. There may even be differences between the effect on children vs. young people/teens to explore.

Implications for pedagogical practice in the context of using ICTs

At certain points clearly reflected in the results, preparation for the digital era does not seem to happen effectively as such (teachers and children and young people alike simply adapt, but it needs to be promoted implicitly and/or mainstreamed in existing curricula and competence acquisition). Inequalities exist more in digital capital than digital competence and hinder digital inclusion; the focus should be put more on providing material resources, that is, devices, access to quality connections, etc., more than the acquisition of digital competence. While this is an important issue in Greece, Romania and also Germany, it has been shown for more digitally advanced countries such as Norway and especially Estonia, where using ICT in education has been a priority for decades. The COVID-19 situation has created additional reason to keep and increase the investments in it. It is crucial that infrastructures of ICT be continuously upgraded.

Drawing from the results of all participating European countries, it is important to emphasise that the variety of digital applications used for teaching is wide (among and within schools), and when it is too wide, it becomes a source of stress for both teachers and children and young people. Teachers sensitised to the fact that the reorganisation of school learning can be tiresome for children and young people try not to overburden them (stress and tiredness was indicated by most children and young people). In this, teachers should have the opportunity to receive support, especially in such matters, to emphasise those young people at risk of dropping out and who might disengage more rapidly without proper access and support. Education should thus strive now more than ever to be as inclusive as possible, particularly referring to ICT inclusivity.

With the changes and advancements in the incorporation of ICTs in education that occurred



due to the pandemic, the question remains which changes can be considered sustainable and will stay and what will happen next in schools regarding the use of digital technologies. Will schools continue the alternation between days for learning at school and learning from home? Again, teacher training that includes learning about ICT and how to effectively make use of it in everyday practice is a key element in children's and young people's learning about and with ICT.

Implications for ICT-related educational policy-making

The importance of having ICT education in school curricula has been emphasised through the results of this study. Systematic support mechanisms should be available for schools, both in terms of infrastructure and know-how. Teachers and schools should be supported in order to reach all children and young people and be equipped and prepared to best promote ICT-inclusivity. As digital technologies have the potential to bridge and close educational gaps between different groups of children and young people while considering different socioeconomic backgrounds, special attention should be given to how digital technologies will remain integrated in the educational process after the pandemic, with tailored solutions for rural and less privileged areas. In addition, it is not only the gap between individual children that needs to be addressed, but also, on another level, the wide gaps in terms of digitalisation between schools at the European level as well as within individual nations.

In that context, an apparent implication from the results of this research is that digitally less advanced schools need to be given a chance to catch up with digitally advanced schools so that all children and young people have equal opportunities to learn about and with ICT and are therefore prepared for their own future endeavours.

The Estonian system of educational technologists (special university-level, permanent positions at schools, providing networking for know-how) could be a good example of best practice for other European countries. There is a need for systematically elaborated support systems for teachers regarding the issues of ICT in education, for example, supervisions moderated by educational technologists or co-visions between teachers to share experiences.

In relation to the implications for ICT-related education policy, the importance of recognising home and peer support should be addressed as it takes on a significant new role with the impact of COVID-19 on education. Recognising the support children and young people receive at home (i.e., from family members) and from peers is instrumental in education. This shows how different ecosystems surrounding children and young people interact and affect each other.

One possibly underestimated source of support during the reorganisation of school learning is peer support, but it should not be provided ad hoc or only self-regulated by students themselves. This could be used for achieving learning outcomes for general competencies, and should be a part of teaching methodology, with more teamwork and less individual work. Furthermore, on digital 'learning from home' days, children and young people should also still have the possibility to work with their peers via video conferencing software, for example.

The importance of support by family members, whether it be parents, guardians, grandparents, siblings, etc., was also evident in the results of this study. Children and young people rely on this support, particularly help in using ICT and with homework, especially in times of the COVID-19 pandemic. Comparing parents' knowledge, attitudes and competencies about using ICT in education, and potential differences between countries, against the backdrop of the pandemic and related distance learning is a vital topic to explore further.

Overall, this study provides valuable insights into how children and young people reflect on their experiences using ICT in education in the context of the COVID-19 pandemic, offers several approaches for further research and, above all, provides empirical findings that once

again highlight the need for educational policy action in various aspects. These include, for example, digital equipment for all children and young people as well as reliable availability of the Internet, the need for teachers to be equipped and prepared for integrating ICT into teaching and learning to provide ICT-inclusivity and effectively fostering children's and young people's digital competences.

Children and young people are very capable of expressing their individual assessments of what they think is going well and what is not, as well as their wishes for the further integration of ICT in teaching and learning. Once again, this highlights the importance of the collaborative ethnography approach adopted in the European DigiGen project, in which children and young people are understood as experts of their everyday lives and engaged as co-researchers and co-designers in the further course of the project, striving to jointly develop concrete practical implications meeting children's and young people's needs and wishes.

Despite all the challenges during the COVID-19 pandemic for school learning in which both social inequalities and development needs in the field of digitally supported learning have become even more apparent, the findings of the exploratory Pilot Study COVID-19 Add-On presented here provide several indications for further development and improvements needed in Europe that should be used for future developments in the field of ICT in education.

In this context, the Digital Education Action Plan of the European Commission refers to the COVID-19 pandemic and underlines the importance of recognising and using the large and growing range of digital technologies (apps, platforms, software) to enhance and expand education and training and highlights the need to equip all students with digital competences (knowledge, skills and attitudes) so that they can learn, succeed and live in a world increasingly interwoven with digital technologies.

Following on from this pilot study, the main study on the topic of ICT will involve interviews with children and young people at two stages, one before and one after their transition to secondary education, to explore how children and young people feel their education prepares them for the digital age. In the five participating countries, the entire data collection phase, covering both phases, will take place from spring to winter 2021.

While the results of this pilot study provided insights into the situation regarding the use of ICT in education as well as into the different needs and wishes of children and young people in all countries, the results of the main survey will reveal the developments in ICT use in education and will show which wishes of children and young people have already been responded to.

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Appendix A Interview Guide for the Pilot Study COVID-19 Add-On

The set of questions in this section provide a guideline for the interviews with children and young people to build up a conversation on their experiences with ICT in education against the background of the COVID-19 pandemic.

Please note: The guideline for the semi-structured interviews is intended to serve as a framework to which the interviewer should refer as guidance during the interview. It therefore lists a number of topics and corresponding questions (including suggested follow-up questions) considered important in order to explore the main research question. How and which questions are actually discussed depends on the individual course of the interview, which is carefully directed by the interviewer but at the same time leaves room for the interviewee to express themselves freely.

Objectives

1. Creating a general picture of life during lockdown referring to ICT in education and children and young people's backgrounds' relevance

1. Assess how ICT was used in school during and after the pandemic
2. Establish an understanding of which children and young people with which socioeconomic characteristics and cultural backgrounds profit, and which educational settings have the potential to support children and young people at risk (e.g., children's and young people's background)

2. Comprehend children and young people's views and their views' impact on the use of ICT in educational contexts against the background of the COVID-19 pandemic

1. Comprehend how children and young people rate and assess the value of their education as a preparation for adult life, and for developing their own way of living and working in the digital age
2. Examine whether there are differences in the way children and young people from different backgrounds assess their education and the extent to which the latter influences their perspectives
3. Examine whether some children and young people feel they are falling further behind than others due to the pandemic

3. Identify the relevance of the COVID-19 pandemic period related to digital technologies in education and changes it might have brought/bring

1. Identify what children and young people consider as threats (risks) in terms of their own ICT use and how the schools can address these threats
2. Identify what children and young people consider as the main potential of ICT use during the pandemic

4. Evaluating teachers' views by children and young people

1. Examine how children and young people think schools are equipped to take remedial action in terms of distance learning during the COVID-19 pandemic
2. Give children and young people the opportunity to evaluate their teachers' and schools' views and their capacity and readiness to support the younger generation in preparing them adequately for the digital age.

5. Understand long-term effect issues

1. Understand the long-term effects of the availability of the Internet on cognitive skills

Pilot Study

This Pilot Study is being carried out within the framework of the 'ICT in education' research project in which country-specific circumstances in terms of ICT use in education will need to be considered. The information being collected in this Pilot Study is in connection with children's and young people's attitudes towards ICT in education and the use of digital devices, especially in times of the pandemic.

From a methodological point of view, the results of this study will be used to both specify the guidelines for the 2021 main survey and to involve children and young people as co-designers in the development of the survey instruments based on the idea of collaborative ethnography. It is the aim of this study to specify the survey instruments in the attempt to discover qualitative data that are as relevant and informative as possible for analysis.

Each country will conduct 2-5 semi-structured interviews (if necessary, via video conference). In the convenience sample, participating children and young people with varying background characteristics (socio-economic status, gender, culture) will be interviewed on the topic of ICT and education.

Introduction

Hi, what is your name? How are you?

Thank you for agreeing to being interviewed. My name is ___ and I am from the University in ___. Together with eight countries we are conducting a European research project on the digital generation and their views of their future. We are trying to learn from children and young people (like you) how prepared they feel for their lives in a digital world. Therefore, there will be a major survey next year. But to find out what is important to be considered when talking to the digital generation (you), we are already conducting a smaller study this year. This should help us to find out which topics in this area are really important for children and young people and what concerns and wishes they may have. This is why I am excited to have a conversation with you and learn from you today, as you are a part of the digital generation. I have several questions and topics, mostly with regard to how you use digital devices and how prepared you feel by school and by teachers for the future, considering COVID-19.

You have consented in advance to participate in this interview and to the interview being recorded. If this is still the case, I'll start the audio-recording now.

<p>The last months have been very special when it has come to schooling and learning. Due to the pandemic schools had to be closed and now they have reopened, but the pandemic continues. How have you experienced this time so far? <i>[Get a first impression and introduce the topic]</i></p>	<p>What have you missed? What has changed? What role does ICT play? Could you please tell me a little more?</p>
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Creating a general picture of life during the pandemic/Use of ICT in education and children's and young people's backgrounds' relevance

<p>Could you please describe how schooling has been organised for you in the COVID-19 pandemic so far? Let's now move on to talking about digital devices and digital learning especially against the background of the COVID-19 pandemic situation. In our case digital devices can refer to such things as smart phones, desktop computers, notebook or laptop computers, netbook computers or tablet devices.</p>	<p>What was the pandemic period like in the beginning, middle and end (when schools reopened)? What role did digital technologies play during that time?</p>
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<p>How did you experience the use of digital technologies in this time?</p>	<p>What have you missed? What has changed?</p>
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Are there any special things that happened during the time of lockdown when schools were closed?	What kind? Can you give an example?
What role do digital technologies play?	Could you please tell me a little more
Did you use a computer or any other digital technologies and devices to learn at home during the pandemic? Tell me a little about that. (If NO / YES, see further questions below.)	<i>[Ask about set-up at home: Is there a computer at home? Do you share a computer with your family? What other digital devices do you use at home?]</i>
NO	
Have you been in contact with teachers and classmates?	How did you do that? What did your teachers do during the pandemic?
Who supported you in learning during the pandemic?	How did you parents/siblings support you in learning during the COVID-19 period?
Did you go on learning at home without digital devices?	How did you do that and do you think it was successful?
How did you manage not to lose the thread in learning?	
How did you feel in the whole situation, especially with the idea of what the follow-up will be like when the school goes on again?	
YES	
Did you work with your classmates during the pandemic?	If yes, how (online in a chat, video call, etc.)? If no, how did you feel about that?
What are some of the digital devices (apps or programs) that you have been using for school?	Where did you get to know them? Did you get help to learn how to use them? OR Did you help anyone use that/those ICT tool(s)?
Were your family members helpful during the pandemic?	Who helped and what did they do to help?
Have your teachers been helpful during the pandemic?	What did they do to help? (Next to subject related material, could they also offer help in how to use and learn with digital technologies?)
What has been your favourite part about using digital technologies for school during the pandemic?	
What has been your least favourite part about using digital technologies during the pandemic?	
What did you miss most about school during the COVID-19 pandemic?	Why? What was hard about learning from home and not at school?

<p>Do you think you could have studied at home all by yourself when the lockdown due to the pandemic started?</p>	<p>Or was it good to get help from your parent(s)/ guardian(s) (or siblings, other family members...)? How exactly have you been supported? (Have you received help in the form of knowledge in specific subject areas or technical support in using digital equipment?)</p>
<p>Did you learn any new skills (in using digital devices) during the pandemic?</p>	<p>What kind of skills? Skills in using digital technology or also new specific subject related skills? Why and how did you learn them? Do you think this might be helpful in your future? If so, why?</p>
<p>Evaluation of teachers' views by children and young people</p>	
<p>When you think about your teachers, how competent (and willing) have your teachers been in supporting your digital learning during the pandemic?</p>	<p>Why do you think that? Can you give examples? Do you think they were prepared to give you the best possible learning alternatives during lockdown?</p>
<p>How do you see and appreciate the use of technology by your teachers? How good are they at using technology? Can they help you to become better in using technology? What are your teachers doing to prepare you for the digital age?</p>	
<p>How much and in which way do you think your teachers like using digital devices to prepare children and young people your age for the digital world? Do you have any idea why your teacher likes/ doesn't like to use digital devices?</p>	
<p>Is there a difference in the use or handling of digital technologies by your teachers now compared to the situation before lockdown? (If school has not yet started again: Do you think there will be a difference in the use or handling of digital technologies by your teachers now compared to the time before the pandemic?)</p>	<p>Do you think they've been willing to take this opportunity to further develop their skills in this area to give you a wider range of learning possibilities?</p>
<p>Comprehend children's and young people's views and their views' impact on the use of ICT in educational contexts against the background of the COVID-19 pandemic</p>	
<p>How do you think school life could be changed by the pandemic?</p>	<p>Why or why not? How? Do you think school will contribute more intensively to preparing you for growing up and also for adult life in the digital age? How?</p>



To what extent has the COVID-19 pandemic influenced and changed your attitude towards digital devices in education?	To what extent has the COVID-19 pandemic influenced and changed your attitude towards digital devices in education? How do you feel about digital devices and - your future - when you're a grown-up - life when you're finished with school?
Do you think the pandemic might have had more negative effects for some children and young people than for others?	Why? Can you give an example? (Do you think children who have more devices and better access, or can buy apps benefit more? When? For what purposes?)
Identify the relevance of the COVID-19 pandemic period related to digital technologies in education	
What do you consider as threats (risks) in terms of your own use of digital technologies?	Are there any risks you've become more aware of during the pandemic period?
Do you have an idea of how schools can solve/address these threats (risks)?	
Are there any negative aspects that come to your mind regarding learning with digital devices? Are there any differences to your experiences before COVID-19?	
Understand long-term effect issues	
If you were asked to rate on a scale from 1–10 how much you think digital devices support your abilities (attention, motivation, creativity and learning), where would you place it on the scale? 1=not good; 10=very good	Why?
Questions on children's and young people's background	
Thank you very much for giving us an insight into your perspective and for helping us to understand what are important issues for children and young people of the digital generation. Now that we have talked a lot about the subject of digital learning and digital life, I would like to ask you to tell us more about yourself.	
How old are you?	
What grade are you in?	
Do you have any hobbies?	
Do you already know what you want to be when you grow up?	Can you name the field of work or area of interest you see yourself in in the future? If yes, what profession do you have in mind?
In what country were you born? If the child was born in another country: Do you have any relatives (grandma, grandpa) in _____ who you go to visit?	
Were your parents born in the same county as you? If not: In what country were your parents born?	
What language do you speak at home most of the time?	

What language or languages do you speak with your friends?	
Do your parents or guardians work in a paid job?	a) If yes (both) What are your parents' or guardians' main jobs? b) If yes (only one parent/guardian) What is your parent's or guardian's main job?
Questions about wishes and closing words	
If you were me, asking other children and young people your age questions about digital devices and school, what would you want to ask?	Why? Is there anything else you would do?
Thinking of experiences you've had in terms of digital technologies for school purposes during the lockdown period, if you could make three wishes now, what would you wish for regarding digital technologies in school?	
Now I am done with my questions. Or in your opinion, did I forget to ask something? Would you like to add something or ask me any questions?	
Would you like to stay in touch to receive the results of the research? If yes, please leave us your email address or social media handle. In the meantime, you can follow us on Twitter, Facebook or Instagram.	
Thank you so much for this great talk!	



Appendix B Category System for the Pilot Study COVID-19 Add-On

Categories	Subcategories
ICT access outside school	Hardware (e.g. tablets)
	Software (e.g. programmes, apps, cloud...)
ICT access in school	Hardware (e.g. tablets)
	Software (e.g. programs, apps, cloud...)
ICT use in school for school-related purposes	Interaction and communication
	Content creation (developing products)
	Practicing/Learning on your own
	Collecting and evaluating Information
ICT use outside school for school-related purposes	Interaction and communication
	Content creation (developing products)
	Practicing/learning on your own
	Collecting and evaluating information
Learning management using ICT	Motivation
	Feelings
	Self-regulation
Support by family members using ICT	Help with learning
	Help with technical issues
Support by teachers using ICT	Help with learning
	Help with technical issues
Support by peers using ICT	Help with learning
	Help with technical issues
Children's and young people's attitudes towards ICT (in education)	Most liked aspects
	Most disliked aspects
Children's and young people's interest in ICT beyond school	Hobbies
	Future profession
Benefits regarding ICT in education	
Risks regarding ICT in education	Dangers
	Challenges
Mental health/well-being/stressors in the context of ICT in education	
Changes in school due to COVID-19 (also related to ICT in education)	
Teachers' readiness to integrate ICT in teaching and learning	Digital competence
	Teaching preference (in terms of ICT use for teaching and learning)
	Frequency of use
	Motivation/capacity of teachers to cope with situation
Expected long-term effect issues of ICT in education	Children's and young people's new competences
	Changes in attitudes of children and young people towards ICT
Wishes about ICT in school education	



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