Developing a Toolkit for Contributing to Digital Competence: A Review of Existing Resources

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Introduction

Broad access to digital information technologies offers members of society, especially children and young people, the opportunity to explore the virtual space for their own personal and professional development. At the same time, the use of digital technologies generates several risks related to the safety of children and their well-being, which need to be addressed and counteracted by creating learning contexts for children that allow them to explore, debate, formulate and learn the principles of safe, valuable and creative use of digital technology. Today's children and young people, often referred to as *digital natives* (Bennett & Maton, 2010; Prensky, 2001a), are living in a paradox, and despite growing up with technology, several studies reveal that their digital skills are not sufficient to protect themselves, navigate the Internet safely and operate different

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digital devices (Eynon & Geniets, 2016; Livingstone et al., 2017). Tran et al. (2020) argue that many young people belonging to the generation of digital natives have limitations in using digital technology, especially for educational purposes. Likewise, other researchers indicate differences between the false impression that young people are very competent and that their digital skills are sufficient (Evans & Robertson, 2020; Helsper & Eynon, 2010).

The basis for this chapter is a scoping review as part of a process to develop a toolkit to improve practice concerning children and young people's digital technology use. As shown in interviews with families and focus groups with children, Kapella et al. (2022) and Bărbută et al. (2022) provide evidence that as early as age five, children acquire problem-solving skills, learn vocabulary, read, write, calculate, listen to music, draw and generally develop a range of skills through their use of digital technology. For children and young people, the need to improve the impact of digital technology on their quality of life and educational attainment requires an understanding of the *capabilities approach* (Kimhur, 2020) in the context of their relationship with the digital world (through digital technology use). From this perspective, children and young people need guidance to navigate through the risks of digital technology and utilise the opportunities they offer. This requires digital education aimed at using technology innovatively and creatively.

Given the observations made, identifying and developing digital education materials, specifically toolkits aimed at promoting safe, competent, and responsible use of digital technologies among children, young people, parents, educators and other stakeholders, is an important task. An evidence-based approach has gained popularity among academic researchers and policymakers (Cairney et al., 2016; Christensen, 2021).

This chapter discusses the state of the art of policy recommendations, guidelines and toolkits designed to develop children's and young people's digital competence, fight digital inequalities and promote digital inclusion. Our objectives are to identify knowledge gaps, clarify definitions or concepts, and examine if the identified guidelines/toolkits are based on research data. In our literature review, we aim to answer the following research questions: (1) What do the identified digital toolkits contribute in terms of digital inclusion? (2) What role does academic research play in the development of guidelines/toolkits? and (3) At what level are

existing toolkits focused on (*micro*, *meso* or *macro* levels) and what recommendations are made?

In our perspective, offering research-based toolkits to children and young people can mitigate risks, maximise the positive outcomes of digital technology and facilitate positive outcomes of ongoing digital transformations in society.

The Digital Ecosystem: A Framework for Understanding Digital Inequalities

The terms digital inequalities, digital literacy and digital inclusion have been widely used in discourse related to digital technology use. Even though these terms are rarely defined, and their meanings shift with technological changes, these concepts have driven many digital-related policy decisions. The lack of access to technology and digital skills is a barrier to online participation, and a significant source of exclusion, inequality and social isolation (Tyers-Chowdhury & Binder, 2020). Promoting broad access to data and enhancing children's capabilities to understand digital processes and the competent, critical and creative use of digital technology and digital content are some of the main topics in developing strategies and practices for digital inclusion. Digital technology has become a fundamental part of education, cooperation, cognitive development, entertainment and socialisation of children and young people across Europe. Digital technology is also becoming an essential part of family life and society.

The analysis of digital divides or digital deprivation shows that children and young people from low-income households and those from other vulnerable groups are at risk of exclusion or marginalisation in the digital arena (Ayllón et al., 2023; Ragnedda, 2018; van Deursen & van Dijk, 2019). Increasingly the focus on the digital divide has moved to a focus on digital inequalities (DiMaggio et al., 2004; Helsper, 2021), where access to digital technology, the level of digital skills and outcomes, and the benefits of using digital technology are essential. More importantly, knowledge acquisition, skill development, changes in attitude and improving the quality of life are crucial issues when using digital technology. Although using different perspectives, several studies (DiMaggio

et al., 2004; van Deursen & van Dijk, 2019; Helsper, 2021) show how inequalities regarding access to digital technology, the level of digital skills, and the benefits and opportunities based on access and use of digital technologies are strongly related to social inequalities (Ragnedda & Ruiu, 2017). Thus, being digitally excluded also means being socially excluded. At the same time, being digitally included does not necessarily translate into social inclusion directly. For instance, Thompson et al. (2014) considered digital inclusion as a policy to close the digital divide and promote digital literacy. The relationship between digital inclusion and children's rights is important, as digital inequalities disproportionately affect specific rights of children in the offline and online world. Therefore, it is incumbent upon those entrusted with legal responsibilities to formulate strategies to promote digital inclusion (Helsper, 2021) and new research (Snilstveit et al., 2016).

From the perspective of resources necessary for a digital inclusion strategy for children and young people, there is a conceptual interplay between the social capital of the individual and digital technology (Bourdieu, 2018). One primary concern in studies addressing digital inequalities is the *evidence-policy gap*. To effectively address digital inequalities among children and young people, a comprehensive digital inclusion strategy must be informed by evidence about the needs, inequalities in access and level of digital skills. However, as we already know, access to digital technologies is not enough to fully benefit from the interaction with digital technology, the level of digital skills and digital literacy being critical factors in this regard. The level of digital competence directly affects the degree of digital confidence (see chapter "Digitally Disengaged and Digitally Unconfident Children in Europe"). Despite the lack of a well-established evidence base linking children and young people's digital skills outcomes (Johannes et al., 2022; Livingstone et al., 2021), research indicates a positive correlation between children and young people's digital skills and educational and mental health outcomes (Dinu et al., 2022; van Deursen & Helsper, 2018). Moreover, access to digital technology, services available through technology and the opportunities present in the digital arena can generate new outcomes and accumulate and improve other types of capital, including social, economic and cultural (Visagie et al., 2017).

Starting from the idea that all the digital systems that young people interact with are interconnected and ultimately create a digital ecosystem—flexible, self-regulating and active—comprehension of the digital inclusion process must include a view of this ecosystem and the digital world. The idea of digital ecosystems is based on Bronfenbrenner's *Ecological Systems Theory* (1977), which posits that child development is influenced by many environmental and individual factors and the various interactions, roles and processes that occur between them. This perspective highlights the dynamic interplay between individual development and the broader contextual factors that comprise the child's ecological environment. Placing the children's needs in the centre, the digital ecosystem should provide interconnected digital technology resources that can function together in the child's best interest. The US National Digital Inclusion Alliance (2019) conceptualises a digital inclusion ecosystem as a holistic and comprehensive approach to addressing digital inequality within a given community. This ecosystem comprises various programs and policies tailored to meet the specific and diverse needs of the community. Collaborative work within this ecosystem should address the various dimensions of the digital divide, including access to affordable broadband connectivity, devices and digital literacy skills.

Following Bronfenbrenner's (1977) systemic theory adapted for use in this book (see chapter "How Can We Understand the Everyday Digital Lives of Children and Young People?") to analyse the risks of digital technologies for children and young people, the policies and resources for guiding them to acquire digital skills and competence were also imagined in a systemic way: *micro*, *meso* and *macro systems*. We build on this and imagine the role of academic research through three different levels (see Fig. 1).

At the *micro* level, by applying user-centric and participatory approaches, assumptions are made that individuals will be empowered and, as such, allow the researcher to list the aspects that seem problematic to them concerning the subject of digital inequalities. According to Bronfenbrenner's (1977) theory, the microsystem represents the most proximal and immediate setting in which children and young people experience their development. This microsystem encompasses the various contexts of the child's life, including the home, educational institutions, peer groups and the broader community. Digital inclusion is a means of

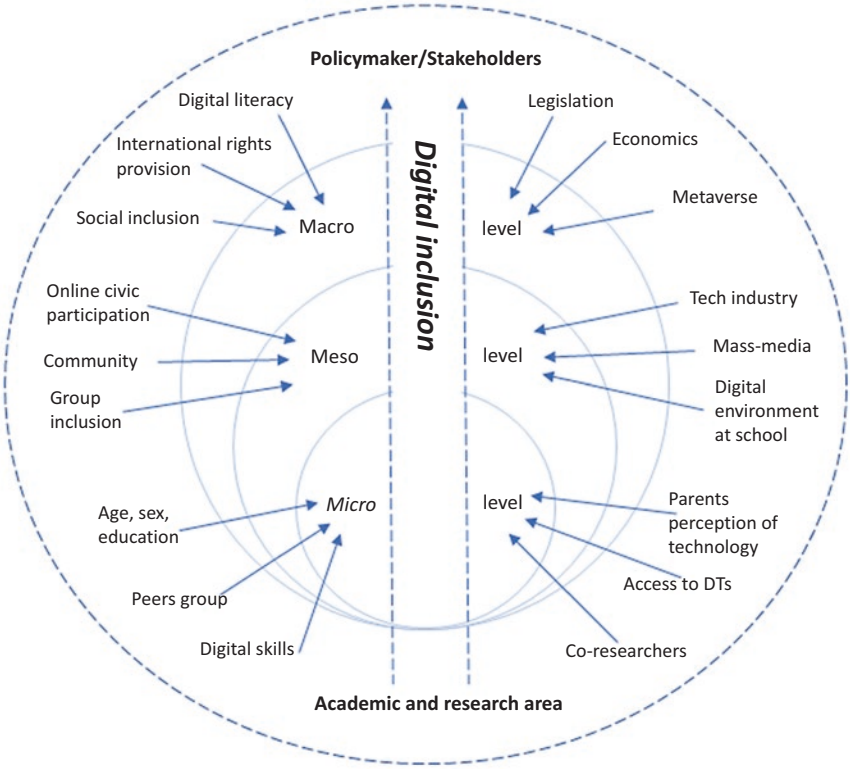

Fig. 1 The role of academic research in digital inclusion at different levels

accessing digital resources for individuals without access. It can refer to training or other opportunities to develop digital skills and comprehension.

The mesosystem describes the linkages and relationships between the various microsystems, such as the home, school, peer group and community. As such, it represents a system of microsystems and how they interact to shape the digital life of children and young people. Research and policy recommendations at *the meso level are meant to reduce digital inequalities through better coordination between the* microsystems. For the education domain, digital resources bridge the engagement of parents from different socio-economic backgrounds, educational levels and ethnic origins in their children's education. Based on the common perception supported by research that direct collaboration between the family

and the school can improve the student's academic performance (Mora-Ruano et al., 2019), numerous digital resources were developed to strengthen the cooperation between parents and teachers.[1]

Collecting data regarding educational and digital inequalities at the macro level can serve as a basis for developing programs that improve children's access to digital technology. An example is the Media and Information Literacy (MIL) strategy, developed by the Council of Europe (2022),[2] which is the primary tool for empowering people, communities and nations to participate in and contribute to global knowledge societies. In the view of the Council of Europe, developing cognitive, technical and social skills and capacities is crucial for individuals, as it empowers them to proficiently navigate media content, engage in critical analysis, make informed choices regarding media consumption and utilisation, comprehend the ethical implications of media and emerging technologies, and communicate effectively through content creation.

The United Kingdom's National Digital Inclusion Network has developed a strategy that includes all three levels of digital inclusion.[3] This network was created to minimise the digital divide by building upon existing good practices to support children with digital inclusion and scaling up the efforts of local and regional organisations and charities to national initiatives. They provide a comprehensive support package comprising training and resources that help citizens respond to their community's digital skills and inclusion needs. This includes Learn My Way, run by the Good Things Foundation (2023), promoting a learning platform for developing basic digital skills in communities, and is designed to build digital confidence quickly. This can be an example of good practice regarding an intervention at all three levels in minimising digital inequalities. At the micro level, they offer digital skills training and have a National Device Bank supporting people who cannot get online because they cannot afford a device of their own, contributing to the circular

[1] There is an industry of such platforms offering a framework of meaningful cooperation between parents, teachers and school management. https://www.commonsense.org/education/lists/apps-and-websites-for-improving-parent-teacher-communication

[2] The Council of Europe developed the media and information literacy guidelines that target education for digital citizenship and offer resources to children, parents, stakeholders and policymakers, as well as to larger communities. For more information, see https://www.coe.int/en/web/freedom-expression/media-literacy https://www.coe.int/en/web/freedom-expression/media-literacy

[3] For more details, see: https://www.goodthingsfoundation.org/our-network-services-map/

economy. At the *meso level,* the National Data Bank is a 'national food bank for connectivity data' to help hundreds of thousands of vulnerable people in communities across the UK. The National Databank provides at least 500,000 free SIMs and mobile data distributed through their initiative.

European Strategies and Policies

To ensure children's right to education, information and participation in social life and to provide the possibility to benefit from the opportunities offered by digital technologies, as well as to prepare children to face the challenges that a digital society brings, the existing digital inequalities should be addressed by the scientific research field, at all institutional levels: primary, secondary and tertiary (Fuchs, 2009). In January 2018, the European Commission adopted the Digital Education Action Plan as an integral part of its commitment to creating a European Education Area, revised in 2020 (European Commission, 2020), including 11 actions to support technology use and developing digital competence in education. The action plan has three priorities, setting out measures to help EU Member States to meet the challenges and opportunities of education in the digital age:

- Fostering the development of a high-performing digital education ecosystem by making better use of digital technologies for teaching and learning;
- Enhancing digital skills and competences of children and youth for digital transformation and
- Improving education through better data analysis.

The action plan aims to respond to these priorities:

- Tools to help educators and trainers make better use of technology including better Internet connectivity;
- Targeted action to develop relevant digital competences;
- Reinforced and new efforts to improve education via better evidence and analysis and

- Focus on enabling factors for successful digital education and skills.

After the COVID-19 pandemic period, which revealed structural weaknesses and inequalities in the capabilities of states, education and health systems, families and children to effectively use digital technology for responding to the systemic crisis, the European Commission went beyond the digital education plan and developed *A Digital Decade for children and youth: the new European strategy for a better internet for kids*(BIK+)[4] (European Commission, 2022). The strategy states that the Member States should develop 'age-appropriate digital services, with every child in Europe protected, empowered and respected online, and no one left behind' (European Commission, 2022, p. 9). The main three pillars of this strategy are:

- Safe digital experiences to protect children from harmful and illegal online content, conduct, contact and consumer risks and to improve their well-being online through a safe, age-appropriate digital environment created in a way that respects children's best interests.
- Digital empowerment, so children acquire the necessary skills and competences to make sound choices and express themselves in the online environment safely and responsibly.
- Active participation, respecting children by giving them a say in the digital environment, with more child-led activities to foster innovative and creative safe digital experiences (p. 9).

The basic principles of the strategy are to respect children's right to actively participate, shape the digital environment, and support the digital creativity of children and young people. It states that children have the same rights in online and offline environments, meaning they have the right to enjoy the opportunities and be protected from the risks of using digital technologies, programs and platforms. Thus overall, the goal is the improvement of online well-being; children's protection from harmful online content, contact and conduct; and the empowerment of children, including those most vulnerable with competences to manage online environments safely and responsibly. According to the Strategy (Council

[4] see https://digital-strategy.ec.europa.eu/en/policies/strategy-better-internet-kids

of Europe, 2022), the EU funds the network of Safer Internet Centres and the Better Internet Portal[5] to renew and enhance the range of tools for children and young people, parents and teachers.

In the digital world, the ability of children and young people to exercise their rights often depends on factors beyond the reach of children and parents: their access to digital technology and their connectivity, but also on social deprivation, minority or refugee status. Thus, children and young people are often limited in their use of information and communication technology (ICT) use, due to the social inequalities they face, which may leave them without adequate access to ICT despite the increases in new technologies and Internet resources within societies (see Ayllón et al., 2023). Other times, parents and educators would like to control and might limit access for children and young people, eventually reducing digital skills (Livingstone et al., 2017). However, children and young people might be motivated to learn through digital technology, leading to the need for support and scaffolding. Recent research suggests that for children and young people, the use of digital technology is essential for their overall well-being (Dienlin & Johannes, 2020). However, there is a need for guidance and guardianship to ensure healthy and safe use. Often their parents or teachers lack sufficient competence and are not fully equipped to support children and young people to thrive in the digital environment (Gudmundsdottir & Hatlevik, 2018). Furthermore, many children and young people may be more knowledgeable regarding the use of digital technology, meaning that the caregivers responsible for children also need guidance (Lu, 2022).

Based on the recommendations and findings from the larger research project reported on in this book, it became clear that there was a need for active and effective communication between adults and the digital generation (children and young people). The evidence from the overall research, structured as good practices, showed that children and young people need adults to talk to about what they experience when using digital technology. In the next section, we will briefly describe the methodology used to analyse and understand the range of toolkits available.

[5] The Better Internet for Kids Portal provides information, guidance and resources for the safe use of digital technology see also www.betterinternetforkids.eu

Research Methodology

A scoping review was conducted to provide an overview regarding the frequency of the recently published scientific-based papers that explore digital inequality issues and to identify which dimensions of digital inequalities are addressed in public policy recommendations. The primary inclusion criterion for the analysis of the articles and examples was that they must present examples of good practices and policy recommendations about the use of digital technology among children and young people in various contexts and dimensions of their lives.

The review employed a multiple peer-reviewed process for the literature search channels: (1) traditional journal indexes (Web of Science, Scopus, ERIC); (2) an open access index (DOAJ) and (3) the national virtual libraries related to each of the partner countries involved in the study. In identifying and selecting the articles, the following keywords were used: *digital inequalities*, *children and digital technology*, *policy recommendation*, *digital inclusion*, *evidence-based studies* and *digital divide*.

Given the purpose and objectives of this research, we found it appropriate to use the scoping review approach as the methodological technique (Seland et al., 2022). We were inspired by the scoping review protocol developed by Seland et al. (2022) involving: (1) the identification of keywords; (2) Use the identified keywords across all databases; (3) Study the selection; (4) Extract and chart the selection and (5) Synthesis. The most common understanding of terminology for a scoping review refers to *mapping*, a process of summarising a range of evidence to convey the breadth and depth of a field (Anderson et al., 2008; Ehrich et al., 2002; Moradzadeh et al., 2023).

A scoping review methodology is used most frequently to examine the extent, range and nature of research activity; determine the value of undertaking a full systematic review; summarise and disseminate research findings; or identify gaps in the existing literature (Arksey & O'Malley, 2005).

Objectives of the Scoping Review

In this scoping review, we closely examined the results of digital education reported in recent studies to capture the empirical trends in assisting children's digital use, to avoid risks and promote competencies by:

1. Determining the frequency of addressing digital inequality;
2. Identifying how the analysed materials address inequalities based on data and on arguments validated with data and
3. Identifying the proposed level of change in addressing digital inequalities (individual, micro, meso or macro).

Data Collection Process

The literature search sought to identify journal articles published from January 2010 to August 2021. The database consisted of 149 published materials on assisting children with digital technologies. The analysis grid used in this literature mapping is also included in Table 1.

We used the program Rayyan, a collaboration and research tool, to help researchers work on systematic reviews and other knowledge synthesis projects which helped in screening and selecting studies/sources even if teams are distributed across different countries.

Results

From the database analysis, three domains of focus were identified:

- Toolkits/guidelines promoting the inclusion of digital technology in education;
- Toolkits/guidelines promoting online child safety and
- Toolkits/guidelines that promote developing digital competencies for vulnerable groups of children to reduce digital inequalities.

Table 1 The items included in the analysis

Items	Characteristics
Publication type	Report Framework for inclusion policy Toolkit/guide Leaflet with practical recommendations (companies, NGOs) Research paper Journal article Not clearly defined
Coverage	National EU (European Union) Global level (international)
Year of publication	The year in which the material was published
Peer-reviewed	Yes No
The language[a]	English or other European languages: Norwegian, Greek, Dutch, Romanian, Spanish, Estonian, French
Funding organisation	Source of research funding (Public, Private, Public-Private partnership)
Areas of focus for the toolkit	1. Reducing gaps in digital technology use by children belonging to low socioeconomic status (SES) and vulnerable groups 2. Regulation of digital technologies use by children to protect them from harm, focusing on age limits 3. Caretakers focusing on the use of technology by children 4. Teachers focusing on the use of technology in education 5. Children who use technology for entertainment, learning and participation in social life 6. Innovation and acceleration of digital technology transformations 7. Policymakers/educational organisations

[a]These languages represented the linguistic expertise within the research group conducting the review

The results are presented based on descriptive statistics of the whole pool selected guidelines/toolkits promoting digital inclusion, followed by the content analysis of toolkits identified as being based on research data.

In total, our mapping included 149 published materials on assisting children and young people's interaction with digital technology, of which:

- Toolkits/guides—31.6%
- Reports—21.1%
- Frameworks for developing policy recommendations—13.2%
- Journal articles—9.9%
- Books/book chapters—8.6%
- Leaflets—5.9%
- Research papers—3.3%
- Others—5.3%

From the reviewed literature (N = 149), over 55% approached the topic of including digital technology in education and supporting children and teachers in using it; in this sample of materials, 27.4% are guides for teachers for using technology in education, and 27.6% are other types of publications that present the use of digital technologies in the school context but use diverse and alternative manners for involving children in the teaching-learning process. From the total number of analysed toolkits/guidelines, 59% referred to the regulation of ICT use by children, focusing on respecting the recommended age limits and screen time for accessing digital technology and platforms to protect them from harm.

The digital inclusion of vulnerable groups and ensuring digital equity are essential aspects of providing equal opportunities for all children. One-third of the guidelines referred to digital inclusion, which aimed to prevent school dropout and minimise the digital divide for educational purposes.

The digital inclusion of vulnerable groups and ensuring digital equity are essential to providing equal opportunities for all children. Here we can identify the need to develop and implement sustainable strategies for digital inclusion, having the potential to prevent school dropout and minimise the digital divide.

Moreover, the concepts presented in the guidelines/toolkits that this mapping exercise uncovered are:

- *Digital literacy*—it is much more than simply *accessing* digital technology or using it as a tool for learning: on the contrary, it means 'developing a much broader critical understanding, which addresses the

textual characteristics of media alongside their social, economic and cultural implications' (Buckingham, 2007, p. 49).

- *Digital natives*—the concept appeared in the literature in the late 1990s and is credited chiefly to Prensky (2001a, b) and Tapscott (2008), and represent the first generation to grow up with new technology and have been characterised by their familiarity with and confidence in, concerning ICT. They have spent most of their lives surrounded by digital communication technology (Gallardo-Echenique et al., 2015).
- *Online safety/e-safety*—refers to children staying safe while being engaged in online activities (UNICEF, 2020c).
- *Awareness of risks*—to which children are exposed in the online environment and development of targeted sets of tools and recommendations to meet these exposures (risks such as cyberbullying, cyber predators, the risk of sexual abuse is increasing, posting private information, phishing, falling for scams, accidentally downloading malware, inappropriate digital content).
- *Digital inequalities*—the gap between individuals, households, businesses and geographical areas at different socio-economic levels, both in terms of their opportunities to access information and communication technologies and the use of the Internet for various activities (Helsper, 2012).
- *Digital inclusion*—the ability of individuals and groups to access and use information and communication technologies (DiMaggio et al., 2004).

Out of the total corpus of literature addressing the topic of digital inequalities and the digital inclusion of vulnerable groups, a mere 24% of the data-based materials included this focus, explicitly consisting of 1 research paper, 8 journal articles and 15 reports.

The key points of a summative content analysis of toolkits analysed which addressed the digital inequalities issues are found in Table 2:

The area of academic research as a complex entity can facilitate digital inclusion by investigating several dimensions of this issue and highlighting the perspective of children and stakeholders providing recommendations based on data obtained and identifying new problematic dimensions

Table 2 Summative content analysis of the toolkits which addressed the digital inequalities

Authors	Scope	Recommendations
European Commission (2014) *Internet Policy and Governance Europe's role in shaping the future of Internet Governance*	Analyses data on children's safe use of the Internet and underscores the necessity of self-regulation by industry	Recommendations for self-regulation of the digital industry to create a system by which they can rapidly deal with any security challenges
Bekker et al. (2015) *Teaching children digital literacy through design-based learning with digital toolkits in schools*	Discusses digital literacy of primary and secondary school students, explicitly identifying tools that can support children's learning	The authors developed a framework for learning digital literacy called RDBL (reflective design-based learning) which outlines important elements to consider when incorporating digital literacy into primary and secondary education using an integrated learning approach, fitting children's interests, teachers' competencies and the targeted knowledge

(*continued*)

Table 2 (continued)

Authors	Scope	Recommendations
UK Department for Education (2017) *Preventing and tackling bullying advice for headteachers, staff and governing bodies*	The toolkit is designed to help schools take action to prevent and respond to cyberbullying as part of their overall behaviour policy	It provides resources for school staff to access digital information on specific issues related to cyberbullying such as: • Provide regular and age-appropriate awareness and education programs on cyberbullying for students, teachers, parents and staff; • Establish clear and accessible reporting mechanisms for students to report incidents of cyberbullying. Encourage students to report incidents promptly and assure them that their concerns will be taken seriously and addressed confidentially • Incorporate digital citizenship education into the curriculum, emphasising responsible and ethical online behaviour. Teach students about digital footprints, privacy settings, online etiquette and the potential consequences of cyberbullying.

(*continued*)

Table 2 (continued)

Authors	Scope	Recommendations
Byrne and Burton (2017) *Children as Internet users: how can evidence better inform policy debate?*	Provides evidence from lower and middle-income countries on the relationships between children's civic engagement, participation, and digital literacy, and discusses possible risky behaviour and negative experiences that might occur.	• Policies need to support both digital literacy and civic engagement of children • Develop and implement comprehensive digital literacy programs that focus on enhancing children's digital skills, knowledge and critical thinking abilities • Ensure equitable access to digital infrastructure such as high-speed Internet connectivity and affordable devices, for all children • Encourage the development and adoption of inclusive digital platforms and applications designed to accommodate children's diverse needs and abilities. These platforms should be accessible, user-friendly, and provide opportunities for collaboration, creativity and social interaction • Development of partnerships with non-governmental organisations (NGOs), industry stakeholders and technology companies to support initiatives that promote children's social participation through digital literacy

(*continued*)

Table 2 (continued)

Authors	Scope	Recommendations
USAID (2018) *Toolkit for International Education Stakeholders. Universal Design for learning to help all children read. Promoting Literacy for Learners with Disabilities*	The toolkit supports the Universal Design for Learning (UDL) educational framework, which guides the development of flexible learning environments that accommodate individuals with special needs	• Embrace the principles of universal design in developing digital products and services. Universal design aims to create products and environments that can be accessed, understood and used by individuals with diverse abilities and needs • Foster collaboration between stakeholders, including educators, parents, policymakers and technology developers, to collectively address the barriers to digital inclusion for children with disabilities • Ensure that digital content is inclusive and represents diverse abilities. This can be achieved by incorporating diverse characters, narratives and experiences that reflect the realities of children with disabilities • Support the use of assistive technologies that can enhance the digital experience for children with disabilities • It is essential to tailor these recommendations to the specific needs and contexts of children with disabilities, considering factors such as the type of disability, cultural considerations and available resources

(*continued*)

Table 2 (continued)

Authors	Scope	Recommendations
OECD (2020, ongoing) *Going Digital Toolkit*	It calculates comprehensive indicators for OECD countries based on national digital strategies Aims to identify the lessons learned from emergency strategies such as those triggered by COVID-19 and digital inequalities among students	This toolkit provides education system leaders with an implementation framework and questions to consider in developing their education responses to the COVID-19 crisis • Incorporates a blend of online and offline learning methods. This approach allows for flexibility, personalised learning and access to a wide range of educational resources. It also ensures that students can continue learning even during unexpected disruptions • Invest in robust digital infrastructure, including reliable Internet connectivity and access to necessary devices such as laptops or tablets • Provide teachers with comprehensive training and professional development opportunities to use technology effectively and adapt to new teaching methods

(*continued*)

Table 2 (continued)

Authors	Scope	Recommendations
UNICEF (2020a) *UNICEF report: COVID-19 pandemic increases risks to vulnerable children and their families in Romania*	Assessment of the digital situation of children and families, emphasising vulnerable categories, in the context of the COVID-19 pandemic	Children from socially vulnerable families had difficulties participating in the online education process Recommendations: • Facilitate parental involvement by providing guidance and resources to support their digital engagement • Development of partnerships with local community organisations and NGOs to provide additional support to children from socially vulnerable families • Develop and curate educational resources specifically designed for children from socially vulnerable families. These resources should be easily accessible, engaging and aligned with the curriculum
Banes et al. (2020) *Using ICT to implement a Universal Design for Learning*	Developed within the education system (UK Ministries of Education) it facilitates the implementation of Universal Design for Learning. To support students with disabilities to acquire literacy and numeracy skills	Technology can serve as an important tool to support the learning of students with and without disabilities and can support the implementation of UDL within the classroom following the Multi-Tiered System of Support (MTSS) model and the Matrix Model of technology

(*continued*)

Table 2 (continued)

Authors	Scope	Recommendations
ADIA (2020) *A national digital inclusion roadmap*	Develops and delivers a strategy to minimise digital inequalities	Developed 12 steps to eliminate the digital exclusion
UNICEF (2020b) *How to build digital solutions for girls' digital realities*	Analysis of the gender gaps in the use of digital technology. Promotes equity through technology. Also, this toolkit supports readers in developing digital products that work for young women and girls as well as male users	• Providing open access to publicly funded innovative technology is imperative to ensure that marginalised populations, who may otherwise not benefit from market-driven innovation, are served • To design a girl's digital reality, you first need to understand that reality. There is a gender gap in girls' digital access and usage • New digital products must consider the range of devices, handset types and older operating systems that girls use • Gender inequalities in some education systems mean that girls and young women often have lower reading and writing skills than boys. Audio or visuals can support and retain female users • Consider female users' privacy and security needs (e.g. designing a private, discreet and secure digital menstruation product) • Include girls by making products available in multiple locations, not only the Google Play Store

While identifying and presenting intervention recommendations for the three levels inherent in the digital ecosystem, the analysis extended beyond the toolkits in the table above to examine good practice guides in the database. Starting from the group targeted in the recommendations identified in the materials related to the issue of digital inequalities, based on the levels of influence of the digital inclusion ecosystem, we identify the following recommendations in each level (micro, meso and macro).

Interventions at the Microsystemic Level

OECD (2020) claims that at the individual level, students' digital competences (skills and attitudes) interact with their well-being and ultimately influence the confidence level with which students use digital technologies. Thus, ensuring access to technology is fundamental to minimising digital inequalities. Indeed, the total amount of digital technology equipment available per student will likely affect decisions on whether and how to use technological resources. The same report indicates that access to and use of digital technology outside of school for learning are vulnerable to similar constraints; students' use of digital technology could be affected by their parent's attitudes and practices. The ySKILLS report (Beilmann et al., 2022) recommends raising parents' awareness that a positive attitude towards digital technology in the domestic environment contributes to higher digital skills and better abilities to cope with online risks. Another report, Save the Children Romania (2019),[6] for children's online safety, recommends that parents should use parental control programs and monitor children's first online experiences to support online safety. Efforts to support children's digital competence require the support of parents and the education sector. To shift educational systems from teaching digital literacy in isolation towards a more horizontal approach, integrating specific digital technological tasks and competencies across subjects, and ensuring digital inclusion for all children, the OECD (2020) considers it necessary to measure the level of students' digital skills systematically.

[6] See: https://www.salvaticopiii.ro/ce-facem/protectie/siguranta-pe-internet

The Learning Passport recommended by UNICEF and elaborated by a consortium of high-profile researchers (UNICEF, 2020c) highlights the importance of focusing on children in the most disadvantaged city districts and remote regions, arguing that access to digital technology can both exacerbate and reduce pre-existing inequalities for children. The Learning Passport gives access to and affordability of digital technology to disadvantaged children and families. It encourages children and family members to improve their competencies by providing a library of open educational resources supplemented by learning opportunities.

Interventions at the Mesosystem Level

The UK Department for Education (2017) aims to prevent cyberbullying through the following measures implemented at the educational institution level: regularly evaluating and updating their approach to take account of developments in technology, updating acceptable use policies for computers and implementing disciplinary sanctions (UK Department for Education, 2017, p. 11). The consequences of cyberbullying reflect the seriousness of the incident so that others see bullying as unacceptable.

Looking at how the educational system can minimise digital inequalities UKCIS (2020)[7] recommends: implementing inclusive technology policies to ensure digital equality in workplaces and schools and developing new strategies regarding the three components of the educational process, namely teaching, learning and evaluation. The ADIA (2020) report recognises the continuing digital divide, which hinders greater social and economic participation within society. The report argues that different sectors must work together to 'harness the collective skills, knowledge and capabilities needed to reduce the digital divide and the ensure digital equality' (ADIA, 2020, p. 4).

Referring to the need to update the curriculum, with students' needs being in focus, and to respect equity in education, Alper and Goggin (2017) suggest using digital technologies during class for children with

[7] See: https://www.gov.uk/government/groups/uk-council-for-child-internet-safety-ukccis

disabilities. After examining the response of the European educational system to the COVID-19 pandemic, the European Commission (2020) recommends the following measures to secure the digital integration of students in the classroom: focus the responsibilities of the different stakeholders on supporting education delivery; choose adequate mode and support for education delivery; empower schools in the delivery of learning and build a resilient system for the future. In education, UNICEF East Asia and Pacific (2020) recommends developing training programs for parents and teachers to better manage information and communication technology and online resources for distance teaching and learning. Furthermore, UNICEF East Asia and Pacific (2020) advocates for creating technology-focused additional courses in the school curriculum to reduce digital disparities and enhance participation in extracurricular activities. The ySKILLS report (Livingstone et al., 2021) includes the following recommendations for improving digital opportunities, targeted at policymakers, parents and teachers: (1) strengthen children's digital skills as a priority on the policy level, research and public agenda, to ensure that children's engagement with the Internet results in well-being at various levels; (2) encourage the design of both informal and formal educational programs that promote digital skills through playful activities and that reinforce children's self-confidence and (3) foster peer-to-peer education, since co-use of digital technology with peers and learning from peers are associated with higher levels of digital skills.

Interventions at the Macro Level

According to Byrne and Burton (2017), access to and utilisation of the Internet can greatly enhance the attainment of various sustainable development goals that significantly impact children's well-being. The authors suggest that the research field should generate various categories of evidence and practices, including methodologies such as *most significant change*, techniques such as *qualitative comparative analysis* and approaches such as *promising practices* or *evidence-based practices*. Regarding children's online safety, the Australian Government has developed a *Survival toolkit* with a button that can be downloaded onto a computer and mobile

phone. Every child can press it if they feel threatened or scared by something or someone they see or meet online. The European Commission (2014), in the report on *Self-regulation for a better Internet for kids*, sets out a series of measures that the signatories need to implement in their services across Europe. These include access control for adult content, awareness-raising campaigns for parents and children: classification of commercial content according to national standards of decency and appropriateness, and the fight against illegal content on mobiles. We can observe the lack of procedures for operationalising and implementing these measures; the recommendations have a general character.

Looking at the use of digital technology by children with disabilities, Byrne and Lundy (2019) claim that much of the responsibility for creating safe and inclusive digital environments rests with governments and parliaments. The authors indicate the following actions emerge as necessary to achieve digital inclusion for children with disabilities: laws and policies on the inclusion of children with disabilities must be reviewed to ensure that they adequately address the digital environment; advice, guidance and resources should be provided to individual schools to ensure that they are using the broadest possible range of assistive and other technology available; governments must involve children with disabilities in the design and delivery of policies and services that impact on their access to and enjoyment of the digital environment.

Identifying Gaps

The lack of insufficient digital skills among teachers, parents and children can deepen inequalities between children regarding educational content. Therefore, UNICEF East Asia and Pacific (2020) recommends developing programs to distribute free IT equipment and resources or to facilitate their purchase at subsidised prices. According to Katz and El Asam (2019), to implement digital literacy programs effectively, it is imperative to establish secure mechanisms that guarantee the competent use of technology for all children.

Several of the data-based toolkits/guidelines provided recommendations regarding the inclusion and use of technologies in education. Most

of the analysed toolkits address the improvement of individual competences, and many include recommendations for teachers and refer to the use of technology for specific disciplines (Math, English, Physics and Biology). Only 9 of the 30 toolkits from this area refer to using digital technology to facilitate and improve the teacher-student relationship. Equally interesting are the concepts that were in focus in the various guidelines/toolkits we analysed: digital literacy, digital natives, online safety/e-safety, awareness of risks, digital inequalities and digital inclusion. What concerns us is the focus mainly on problems, which overlooks what might also be positive in the everyday digital lives of children and young people.

Gaps Revealed by the Scoping Review

Early on in the process of our research, it was seen as essential to develop a practical toolkit for children and young people and perhaps even adults (parents, teachers and other professionals who work with children and young people, such as social workers and youth workers) as a resource to improve communication between members of the so-called digital generation (i.e. children and young people) and adults about experiences in the digital world.

In developing our good practice toolkit, the list of concepts from our review helped influence our work further. In addition to the review, the more extensive research projects' results were crucial in informing our work further. Looking at the results across the entire project, we found one common thread; a lack of or a challenge in communication between children and young people and their parents or other adults like teachers about navigating the digital world. Issues such as what programs and games the children and young people use, with whom children and young people interact, what kind of positive or negative experiences they acquire while online or using digital technology, what they adopt as values or who are their online role models when they follow preferred influencers were some of the issues we identified across the datasets.

For the children and young people involved in the project, our good practice toolkit needed to be developed with content that promotes good

communication between children of different ages and their significant adults (parents, educators). They also pointed out that children's and young people's voices would be central to the toolkit. Such a toolkit may be further upgraded, by anonymising conversations and feeding parent-child conversations to the platform, to offer examples of good communications that can eventually be modelled by others and solve family tensions. Alternatively, where children and young people could share their experiences with adults and, in turn, provide them with an acknowledgement of their agency. This meant we had to include empirical data from our research, using quotes, comments and statements from the children and young people. It was crucial not only for the researchers in the project but, more specifically, for the children and young people that the toolkit should not necessarily focus on what was problematic in their digital lives but also on what is positive. Focusing on communication between children, young people and adults (e.g. parents, educators and other adults) was deemed necessary by both parents, children, teachers and the researchers. The result was a unique toolkit consisting of a set of conversation cards[8] (currently available online and in hard copy in English and Norwegian) that stimulate conversations between adults, children and young people, focusing on everyday digital lives, gaming and social media.

Together with developing these conversation cards and our mapping exercise, we have attempted to shed light on the need for more extensive reviews to provide policymakers with research-based evidence needed to make better-informed decisions. We believe such reviews can also contribute to uncovering knowledge gaps (Bates et al., 2007). It is significant to gather fundamental data on the usage, accessibility and purpose of technology to comprehend children's diverse experiences and requirements and guarantee that policies cater to the multifaceted needs of all children. This mapping and research data can help children and young people develop the necessary digital competence needed to improve their well-being and everyday digital lives.

[8] The conversation cards are entitled *TALK!* Are developed in collaboration also with TENK an education section of the Norwegian fact-checking organisation Faktisk.no. The cards, instructions and support videos are available here https://tenk.faktisk.no/foreldre. The cards can be used online or downloaded as PDF files for printing.

Conclusions

With this scoping review, we identified examples of good practice digital guidelines/toolkits that offer resources for reducing the effect of social inequalities and analysed the domains targeted by the existing guidelines and toolkits. We found that the guidelines/toolkits cover all levels described by the Ecosystem theory (*micro, meso or macro* levels). For the most part, toolkits and guidelines target the necessity to promote social and educational inclusion by giving access to digital technology to marginalised or low-income children. However, a few toolkits offer adapted digital resources for disabled and other marginalised groups of children. A general observation is the low involvement of academic research in developing guidelines/toolkits, with only 24% of the materials being based on research data.

Referring to the use of digital technology in education, the analysed guidelines/toolkits present digital technology as having the potential to support students in their educational process, primarily pointing to the role of the teacher as a facilitator. We found toolkits and guidelines that offer resources to promote digital competence for children, parents and teachers as separate target groups and resources for supporting the collaboration of parents and teachers.

In the larger project that is the basis for this chapter, the central gap seemed to be the communication between children and adults in their ecosystem. Based on the recommendations from children and young people in the project and from our scoping review, we see the potential in capitalising on their opinions and experiences in developing guidelines/toolkits now and in the future.

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