NCCA
An Chomhairle Náisiúnta Curaclaim agus Measúnachta
National Council for Curriculum and Assessment

Research Paper in support of the introduction of Technology

in a redeveloped Primary School Curriculum

Digital Technology—Interacting Safely, Ethically and Responsibly

Professor Brian O'Neill
Technological University Dublin

Contents

Digital Technology—Interacting Safely, Ethically and Responsibly

Children today grow up in a digital world and, for the most part, benefit greatly from it. Yet, as observed by UNICEF in its report, *The State of the World's Children 2017*, digital access can either be a game changer for children or yet another dividing line. (UNICEF, 2017). Digital technologies have unquestionably changed how children access information, communication and entertainment but without the appropriate policies, practices and services in place, their ability to benefit from such opportunities can be greatly undermined.

The *Draft Primary Curriculum Framework* (NCCA, 2020) is one of those 'once in a decade' opportunities to put in place the appropriate curriculum priorities, structure and components that will prepare children for a digital future. The proposed framework includes *Being a digital learner* as a key competency and, alongside the subject of science and technology within the curriculum area of Mathematics, Science and Technology Education (NCCA, 2020, p. 11), aims to support children to become 'creative, confident and critical users of digital technology' (NCCA, 2020, p. 8).

In this context, this paper examines how through promoting safe, ethical and responsible use of digital technology, children's engagement with the digital world may be mobilised to support the goals of the new curriculum. Section 1 provides a brief overview of how the digital environment impacts on children's lives while Section 2 highlights the importance of empowering children to get the most out of their digital technology use. Section 3 draws on the literature and wider policy discourse to frame the discussion of children and digital technology through key concepts such as digital competence and literacy, ethics and empathy, and digital citizenship. Section 4 then elaborates further on what is an evolving policy debate on how best to support children's rights in the digital environment and reinforce the responsibilities of all relevant actors in this area. The paper concludes with

some key messages for curriculum design and enactment to underpin effective integration of digital technology and digital skills across the curriculum.

1. Technology as a pervasive feature of childhood

Children today interact with technologies, digital platforms and online content in nearly all contexts, both at home and increasingly so in schools. The turn to digital technologies during the Covid-19 global pandemic has pointedly illustrated just how central and important digital technologies have become to children's lives. It is the case that the many benefits which the digital environment can offer children's play, learning, and skills development may be offset by concerns about its impact on the health, lifestyles, wellbeing, safety and security of children. From an educational perspective, the challenge is to manage children's exposure to the digital environment in such a way as to maximise its benefits whilst mitigating its possible downsides.

The typical home setting today is often one in which children are immersed in digital technologies. Touchscreen technologies such as tablets and smartphones through their highly-accessible interfaces have enabled children to access the digital world at very young ages (Holloway, Green, & Livingstone, 2013). This is not to say that the digital world dominates children's lives—the evidence in fact shows a much more mixed picture. However, it is the case that the technology-rich environments that parents, teachers and children inhabit underpin so much of contemporary life that it needs to be a foundational element for educational thinking and in particular for the Primary School Curriculum.

According to Eurostat, the share of EU-28 households with internet access in 2019 stood at 89%, up from 79% in 2013 (Eurostat, 2020). However, for households with children, internet access is almost universal with 98% of EU households connected to the internet (Lorenz & Kapella, 2020). Irish households are particularly connected in this regard. While 91% of

households on average have internet access, 99% of households with two adults and children are online (CSO, 2020).

For children, the nature and frequency of their digital access and use continues to evolve and increase. As EU Kids Online report, for most children aged 9–17 across Europe, smartphones and mobile devices are now the primary means of going online (Smahel et al., 2020). This often means that they have 'anywhere, anytime' connectivity, with the majority of children reporting using their smartphones daily or almost all the time. Compared to the first EU Kids Online survey which took place in 2010 (Livingstone, Haddon, Görzig, & Ólafsson, 2011), the last decade has seen the amount of time that children spend online each day double in most countries to approximately three hours per day.

Research on younger children's access to and use of digital technologies, i.e. those under 8 years of age, is less well developed than research with older age groups for whom technology use, risks and safety have been a particular focus (Ólafsson, Livingstone, & Haddon, 2014). The European comparative study, *Young Children (0-8) and Digital Technology* (Chaudron, Gioia, & Gemo, 2018) is a notable exception. This study followed 234 families in 21 countries and has produced rich findings of how children's digital skills develop from a very young age, mostly in the home context, by observing and mirroring parents and older siblings' digital behaviour. Interestingly, the study also highlights that digital does not necessarily dominate children's lives: young children generally have a varied and balanced life integrating sports, outdoor play and creative activities in which digital technology (Smart TVs, video on demand (VOD) and games, digital toys, smartphones, tablets, video-game consoles, laptops and, to a declining extent, personal computers) all play a part.

In an Irish context, children and young people similarly enjoy high levels of access to digital technologies. *Growing Up in Ireland*, the national longitudinal study of children, has since 2009 confirmed high rates of computer access with a total of 86% of all 9-year-olds reporting that they had a computer in their home. Almost all children (93%) from higher social class groups

had a home computer compared with three-quarters (78%) of 9-year-olds from lower social class categories (Williams et al., 2009, p. 121). Two thirds of this 9-year-old child cohort said they used the computer a little with one quarter saying they used it a lot, the most frequent use being for playing games (86%), following by 'surfing the internet' (both for school and for fun) cited by just under 50% of children. The study of the first infant cohort (now aged 12 years) found that more than half of boys aged 7 and 8 years have upwards of three hours of screen time on a typical day at the weekend, whether that is a television, a smartphone, a tablet or other screen-based device (Growing Up in Ireland, 2017).

While the overall availability of research regarding younger children's digital technology use is uneven, a survey in 2018 of some 244 schools and 35,000 children by Zeeko found that more than 60% of primary school children regularly use tablets, computers and games consoles to access the internet (Everri & Park, 2018) with YouTube, Snapchat and Minecraft being among the most popular applications. Research from CyberSafeIreland in 2019 found that among 8- to 13-year-olds, most children in the age group (92%) own a smart device and 60% actively use social media and messaging apps not designed for their age (CyberSafeIreland, 2019).

Recent European research on children's digital lives during the Covid-19 lockdown shows how this turn to digital technology has accelerated. Within the Irish sample, half of households (53%) reported acquiring at least one additional device since the lockdown with the overall average of digital devices in the home rising from 11 to 13 (KiDiCoTi, 2020). Seventy-one percent of children (aged 10 to 18) who use smartphones (56% of the entire sample) said they used smartphones during the lockdown more often than before. Sixty-six percent of children who use gaming consoles (49% of the entire sample) said they used gaming consoles more often than before; 72% of children who use social media (53% of the entire sample) said they used social media more often than before the lockdown; and 65% of children who use direct/instant messaging services such as WhatsApp or Telegram (48% of

the entire sample), said they used direct/instant messaging more often than before the lockdown.

High levels of access and use are, however, not necessarily matched by levels of digital skill or complexity. The notion of 'a ladder of activities' (Livingstone & Helsper, 2007) hypothesises children's progression from relatively passive, entertainment-oriented use (watching video clips on YouTube) to more active forms of engagement and participation which include social communication and creating digital content. Irish children remain on the lower end of this ladder of activities according to the Net Children Go Mobile project, which found that creative digital use was largely absent among Irish children (less than 7% of 9- to 16-year-olds, for example, created content for a website or a blog (O'Neill & Dinh, 2015). Less surprisingly, increasing levels of social media use and online communications for older children, aged 10 and upwards, is apparent (O'Neill & Dinh, 2014) and highlights the need for a solid educational foundation to reinforce safe, ethical and competent digital technology use.

2. Competency frameworks and safe, ethical digital technology use

The need for an educational response to the growing pervasiveness of digital technology in children's lives has long been articulated (OECD, 2012a). Two broad policy priorities are in evidence, dealing respectively with the need to provide children with relevant skills for a digital future, and secondly, the need to reinforce how to use digital technology safely and ethically.

The first policy priority has centred on the need to foster technological literacy and digital competence in order to prepare children to participate actively and effectively in twenty-first century societies. This is represented most clearly in the sustained efforts made to foster technical skills associated with new and emerging digital technologies. Digital competence, for example, was included as one of eight key competences in the original European Reference Framework on Key Competences for Life Long Learning in 2006. Where originally such competence was associated with 'basic skills in ICT: the use of computers to retrieve, access, store, produce, present and exchange information, and to communicate and participate in collaborative networks via the Internet' (European Commission, 2011, p. 1); this has been revised in the updated version to include 'information and data literacy, communication and collaboration, media literacy, digital content creation (including programming), safety (including digital wellbeing and competences related to cybersecurity), intellectual property related questions, problem solving and critical thinking' (Council of the European Union, 2018, Section 4). Importantly, the framework recognises that engagement with digital technologies and content requires 'a reflective and critical attitude' and 'an ethical, safe and responsible approach' to the use of digital tools.

The European Digital Competence Framework, DigComp, stands as the best-known expression of such an approach and outlines the skills and competences needed to 'learn, work, create and engage in a society which is shaped by digital technology' (Ferrari, Punie, &

Redecker, 2012). Its latest iteration, DigComp 2.1, covers information and data literacy, communication and collaboration, digital content creation, safety and problem solving (Carretero, Vuorikari, & Punie, 2017).

Other examples of the technology competency approach include the *UNESCO ICT Competency Framework for Teachers* (UNESCO, 2018) designed to assist education systems to develop and integrate ICT competency policies and standards into their overall education planning. *The Digital Strategy for Schools 2015-2020* (Department of Education and Skills, 2015) stands as a good example of such an application to Irish primary and post-primary education, premised on the integration of ICT and digital technologies to enhance teaching, learning and assessment 'so that Ireland's young people become engaged thinkers, active learners, knowledge constructors and global citizens to participate fully in society and the economy' (DES, 2015, p. 5).

The second main policy priority in terms of the educational response to digital transformation is that related to the substantive issue of online safety education itself. As early as 1996, European Union policy underscored the decisive role that formal education plays in promoting online and digital safety, proposing close cooperation between stakeholders and the educational community to develop the necessary teaching materials to fulfil this task (European Commission, 1996). Schools are frequently identified as best positioned to reach the majority of children and therefore a vital instrument in the development of safety skills and the building of resilience for a host of persistent risks that children may encounter (O'Neill, Livingstone, & McLaughlin, 2011). In 2009, the *EU Safer Internet Programme* called for online safety to be a core subject from as early an age as possible (European Commission, 2009) with most European countries reporting initiatives in this area (Eurydice, 2010; O'Neill & Dinh, 2018).

Online safety education on its own has been criticised as lacking in clarity as to what 'safety' means in any given context. The notion of being 'safe' is subject to wide geographic and

cultural variation. Few online safety education programmes have been found to be properly evidence-based, either in terms of the internet safety messages they contain or any proven evidence of their effectiveness (Jones, Mitchell, & Walsh, 2014). Internet safety messaging when delivered in isolation from children's digital experiences also tends to be reactive in nature, overly protectionist and focussed on raising fears rather than empowering users towards healthy digital behaviours (O'Neill & Laouris, 2013). Accordingly, there have been calls for better alignment of online safety education with youth intervention programmes more generally and to integrating internet safety into already well-established and evidence-based programmes addressing related off-line issues and harms (Finkelhor et al., 2020).

A recognition of the need to place internet safety messages in a wider framework was also marked by the European Commission's own shift in emphasis from a safer to a better internet in relation to its policies and programmes. With the publication of a *European Strategy for a Better Internet for Children* (European Commission, 2012), emphasis was given to empowering children, fostering positive online experiences and supporting the development of quality online content to better serve children's needs. Teaching online safety in response to risks they may encounter remains an underlying pillar of the approach to support children. However, all stakeholders have a role to play in contributing to a better digital environment. Safe, ethical and responsible use of technology is accordingly a responsibility for all and needs to reflected as such in policy.

A shortcoming of both policy trajectories—framing children's relationship to digital technologies in terms of competencies or through an exclusive focus on online safety reinforcement—is that each is oriented towards externally-focussed goals and insufficiently addresses the intrinsic potential of technologies to empower children's self-expression, learning, information seeking and socialisation. To some extent, there is a growing recognition within all such policy frameworks of the need to comprehend and support children's digital experience in a more holistic fashion. A review of online safety education

frameworks by the Australian eSafety Commissioner (Walsh et al., 2020) found that most programmes focused too narrowly on familiar, recognised risks and argued that an effective educational response needs to be underpinned by some 'big ideas' or unifying principles that connect, organise and direct the framework, such as being framed positively and based on children's rights.

An example cited as good practice by the eSafety Commissioner is *the Education for a Connected World* framework developed by the UK Council for Internet Safety (UKCIS, 2020). This aims to support and broaden the provision of online safety education so that it is empowering, builds resilience and effects positive culture change. Organised around eight discrete themes (Self-image and identity; Online relationships; Online reputation; Online bullying; Managing online information; Health, wellbeing and lifestyle; Privacy and security; Copyright and ownership), the programme aims to promote the development of safe and appropriate long-term behaviours, and support educators in shaping the culture within the school setting and beyond.

A similar approach to addressing digital and media literacy more holistically is evident in the Irish resource *Connected*, developed by Webwise for the Junior Cycle Digital Media Literacy Short Course (PDST & Webwise, 2020). This is a good example of grounding safe, competent and ethical digital behaviour around the concept of children's online wellbeing and progressively expanding their awareness of news, information and the problem of false information; big data and the data economy and young people's rights online. An important concept underpinning both resources is that of digital citizenship; a concept which has the potential to act as a unifying concept or 'big idea' to bring together the discrete components of effective educational responses to the transformative impact of digital technologies on children's lives. This is discussed further in the next section.

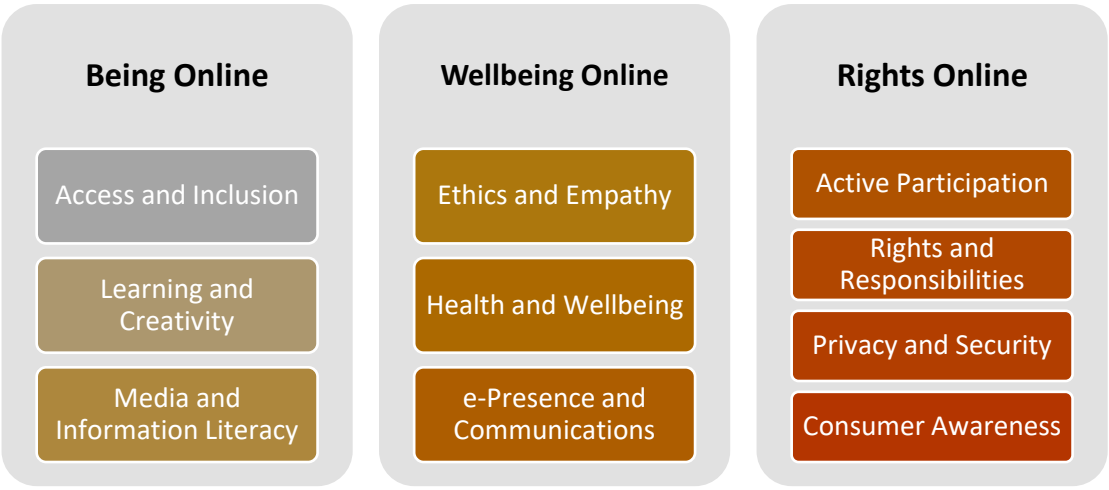
3. Digital citizenship as a key concept to underpin safe, ethical and responsible use of technology

Given the central role that digital technology plays in contemporary societies, it is not surprising that the concept of digital citizenship has come to be associated with effective societal participation and digital citizenship education as being vital to preparing children for future challenges. Digital citizenship is a broad conceptual notion that draws together notions of appropriate, responsible behaviour with regard to digital technology use (Ribble, Bailey, & Ross, 2004) and encompasses closely-related notions of 'global citizenship' (UNESCO, 2015); 'global competence' (OECD, 2018); 'digital competence' (Ferrari et al., 2012); 'digital literacy' (Buckingham, 2010); and 'media and information literacy' (Frau-Meigs, 2012; Grizzle, UNESCO, & United Nations, 2013).

In order to elaborate on its meaning, particularly from an educational perspective, the Digital Citizenship Expert Group at the Council of Europe[1] has undertaken a mapping of the different kinds of interaction that children may have with technology expressed in the form of ten digital domains. These are sub-divided into three broad areas: Being online, Wellbeing online and Rights online (Council of Europe, 2017), each of which has potential for implementation within the curriculum.

Figure 1. Ten digital domains.

[1] https://www.coe.int/en/web/digital-citizenship-education/dce-expert-group



Source: Council of Europe Digital Citizenship Education Project (2017-20)

The strand of Being online comprises three domains which define the context of children gaining access to the digital world and the competences they need to learn, engage and express themselves safely and freely.

- This includes firstly issues of access and inclusion, such as the ability to overcome different forms of digital exclusion as well as the skills needed to participate freely, respecting diversity of opinions.
- Importantly from the education point of view, learning and creativity addresses the experience of being a digital learner and the ability to use the available tools and technologies for creative self-expression.
- And thirdly, the key aspect of media and information literacy is something that enables users to interpret, understand and use media platforms effectively and through a critical lens.

Consideration of *Being online* within the curriculum calls on the values, attitudes, skills, critical knowledge and understanding associated with each of these domains. For example, a focus on inclusion can help build children's awareness of others and how some may be deprived of educational opportunities. As digital learners, children can develop a better understanding of

their own potential as well as the skills of working with others through collaboration. And with regard to media and information literacy, children from a young age can develop competence in solving problems, finding information, forming opinions, evaluating sources and interpreting what they read.

The strand of Wellbeing online, or 'digital wellbeing' (Nansen et al., 2012), encompasses competences that emphasise positivity in children's digital interactions.

- These include ethics and empathy, which concern online ethical behaviour based on skills such as the ability to recognise and understand the feelings and perspectives of others, something that is recognised as crucial to developing healthy online interaction and mitigating risk of harmful communication (James et al., 2017).
- Health and wellbeing, including related notions of digital wellness, relates to the importance of recognising all of the ways in which the digital environment impacts on health, including but not limited to excessive use, balancing physical and online activity, ergonomics and mental health.
- Thirdly, e-Presence and communications relates to the skills of interpersonal communication needed both to develop and maintain an online identity and to engage positively with others in digital environments.

The curriculum is again well-placed to support children's attainment of the competences for digital wellbeing. Children can learn the skills of ethics and empathy through openness to others and valuing cultural diversity, other world views, beliefs and practices. A consideration of health and wellbeing can support self-efficacy and act as a foundation for the attainment of greater self-fulfilment. Finally, through a focus on skills of communications in a digital context, children can learn about positive online interactions, how to manage one's personal identity and data and enhance their overall communication skills.

The third strand of Rights online draws together aspects related to the rights and responsibilities of citizens in complex and diverse digital societies.

- Firstly, active participation addresses the ability to use digital technologies to support positive and active engagement in democratic culture and underlines the importance of participation in that society.
- Rights and responsibilities relate more explicitly to innate human rights principles that underpin all digitally-mediated relationships, and which seek to advance codes of conduct that are cognisant of and respectful of all rights holders.
- Privacy and security encompass the central issues related to personal data deriving from online presence and the critical awareness that is required to both manage and protect against threats to privacy, personal data, safety or security.
- Finally, consumer awareness refers to the distinct literacy skills needed for the commercialised basis of so much within digital societies and to both guard against commercial exploitation and develop the critical awareness of the business processes in data-driven societies. The themes relating to privacy and security and consumer awareness become especially relevant in the context of Artificial Intelligence which is increasingly impacting on children and young people's experiences.

From a curriculum perspective, children become aware of the importance of participating in one's community—online or offline—as an essential part of life and learn how to use digital tools to ensure their voice is heard. The curriculum can also support greater understanding of children's rights as they apply in the digital environment; how to defend all users' rights and to learn how to respond in cases where rights are violated. Just as children learn about privacy and safety in the real world from the earliest age, a focus on digital safety, security and privacy can give children real insights into how to manage their profile and their personal data in a digital context. Consumer education in a citizenship context can foster

understanding about the economic context but also enable children to think critically about sustainable consumption, and social and ecological responsibility.

Overall, the digital citizenship education framework, now endorsed by the Council of Europe's Committee of Ministers (Council of Europe, 2019), is a timely resource that can help support attainment of competences from earliest childhood to adulthood. The framework is designed to be comprehensive but also flexible and suited to all ages and levels of education. A *Digital Citizenship Education Handbook* has now been developed to help educators build on its potential for implementation with the curriculum (Council of Europe, 2019). The challenge for educators is to create a context in which digital technologies may be harnessed to prepare children for the profound impact that digital technologies will have on their lives, their future opportunities for employment, and their exercise of freedom of expression and citizen participation. This also requires an enabling policy and regulatory environment, which is touched on briefly in the next section.

4. The policy landscape impacting on use of technology for children (4-13 years old)

The impact of digital technology in society more generally, of course, has been the subject of intense debate and political attention. This final section highlights some recent and emergent policy trends that are likely to impact on digital policies and specifically on the educational sector, thus informing its development in the short to medium term.

From an historical point of view, policy towards safer use of digital technology, particularly by children, falls into three main phases, coinciding broadly with the rise to prominence of digital technologies as a whole. These illustrative policy phases do not always follow sequentially and may indeed overlap in different countries according to the prevailing cultural and political context (see O'Neill, 2018).

1) In the first phase, children's digital safety may be seen as primarily centred on protecting the child from online risks conceived as an extension to threats in the physical world, requiring measures based on restriction of access and mitigation of risk, as evidenced by restrictive or protectionist approaches.
2) A second phase may be seen to attempt a balance between children's rights to protection from harm on the one hand and the provision of appropriate supports, content and opportunities suited to their age on the other, as evidenced in the shift in policy focus from a safer to a better internet.
3) And thirdly, a more recent phase of development is illustrated by the growing recognition of a more profound digital transformation of society and whereby children's online safety is viewed as a necessary condition for their full and active participation and as an expression of their active participation in that society and of their digital citizenship.

While most inter-governmental agencies are urging a greater focus on the third phase of policy development, i.e. supporting the needs of children as rights holders, as active digital actors and as citizens, within most individual countries the prevalence of protectionist approaches (Phase 1) or balancing these with some positive supports (Phase 2) remains dominant.

The increased attention to children's rights in the digital environment is perhaps the best expression of policy making within this so-called third phase. One prominent example is the Council of Europe's Guidelines to respect, protect and fulfil the rights of the child in the digital environment, Recommendation CM/Rec(2018)7, adopted in July 2018 (Council of Europe, 2018). The Recommendation sets out detailed guidelines regarding the right to be heard, access to the digital environment, rights to freedom of expression and information, empowerment through digital literacy while underlining the importance of safety, security and data protection and privacy. It recommends that governments review their legislation, policies and practice, to ensure children's rights are promoted within a digital context, that appropriate oversight is developed to ensure that business enterprises meet their responsibilities, and all relevant stakeholders ensure concerted action and co-operation at the national and international level to uphold and respect children's rights.

The UN Committee on the Rights of the Child has similarly argued that 'States should adopt and effectively implement comprehensive human rights-based laws and policies which integrate children's access to digital media and ICTs and ensure the full protection under the Convention and its Optional Protocols when using digital media and ICTs'. (UN Committee of the Rights of the Child, 2014, pp. 18-19). A General Comment on the rights of the child in the digital environment is planned for publication in early 2021.[2]

[2] https://www.ohchr.org/EN/HRBodies/CRC/Pages/GCChildrensRightsRelationDigitalEnvironment.aspx

Other international or inter-governmental agencies adding their voices to the need to make mainstream a rights-based approach to children's online and digital presence include the OECD, which is planning to update its Recommendation on the Protection of Children Online (OECD, 2012b); the European Union, which is likewise updating its European Strategy for a Better Internet for Children (European Commission, 2012); UNICEF, whose report The *State of the World's Children* 2017 focused on children in the digital world (UNICEF, 2017); and the European Network of Ombudspersons for Children (ENOC), which adopted a position statement on children's rights in the digital environment at its meeting in Belfast in 2019 (ENOC, 2019).

At the national level, children's online safety and the need for better protection remains the predominant theme. This reflects ongoing political debate about the role of the state in regulating technologies and putting in place protections for children. The Action Plan for Online Safety 2018-2019[3] launched by the Taoiseach in July 2018 was the first whole-of-government approach to digital safety (Government of Ireland, 2018). This implemented a series of actions over the 18-month period to the end of 2019 to promote online safety for all, through better information resources; better supports, including initiatives to support curriculum development and positive online content for children; stronger protections through legislation and regulation; as well as support for more research and consultation with young people.

The *Programme for Government*—Our Shared Future (2020), commits to the enacting of the Online Safety & Media Regulation Bill (DCCAE, 2019) and the establishment of an Online Safety Commissioner as part of a wider Media Commission to introduce greater regulation of the audio-visual and online landscape. Proposals include the introduction of a new system for the regulation of harmful online content, codes of conduct for digital service providers and

[3] https://www.gov.ie/besafeonline

updated regulatory systems for video sharing platforms such as YouTube. The Programme for Government also undertakes to promote positive digital citizenship among children and young people in conjunction with all relevant state agencies and educational partners (p. 87).

In education policy, the Digital Strategy for Schools 2015-2020 (Department of Education and Skills, 2015) is the most significant policy statement relating to the use of digital technologies in teaching and learning. There are specific actions in the strategy that relate to the promotion of the safe and ethical use of technology in schools. The Digital Learning Framework for Post-Primary Schools (DES, 2017) also provides a structure allowing schools to identify where they are on the journey towards embedding digital technologies in teaching, learning and assessment, and to enable them to progress in that journey.

Outside of policy statements on ICT in education, relatively little attention has been given to the positive potential of digital technologies in terms of overall child or youth policy. Better Outcomes, Brighter Futures (DCYA, 2014), the national policy framework for children and young people, includes a provision for promoting positive influences for childhood. New technologies are, however, portrayed somewhat negatively as an influence on childhood. Its primary response is on increasing the digital literacy of young people, 'to build their skills and understanding about being safe online, and to continue to address the commercialisation and sexualisation of childhood with retailers and others' (DCYA, 2014, p. xii). The role that social and digital media play in the lives of children and young people is also referenced in the National Youth Strategy 2015–2020 and includes a reference to the quality of media provision and the acquisition of digital skills (DCYA, 2015, p.27). Social and digital media are also referenced in terms of young people contributing ideas to their communities in the 'media of their choice' (DCYA, 2015, p.24).

The policy space relating to digital technology and digital services is a rapidly evolving one. The range of new legislative proposals, nationally and internationally, and the proliferation of new policy frameworks gives some indication that there is an emergent consensus towards

the greater involvement of the state, an increased focus on ethical business processes and a need for greater transparency and accountability of digital undertakings. Yet, the policy world frequently struggles to keep pace with the speed of technological development. New developments in Artificial Intelligence (AI), Big Data, Virtual and Augmented Reality technologies and so on often outstrip the ability of policy makers to anticipate their outcomes or assess the potential societal impact. The challenge for educationalists is to ensure that the best interests of the child are to the fore when implementing digital technology in the classroom. For instance, to what extent will AI influence the experience of children in the classroom, where their personalised learning is designed by AI and not the teacher? How do we ensure the protection of children's personal data when using digital technologies? Do partnerships with private sector providers of digital services undermine children's educational experience? These are tricky dilemmas that teachers and policy makers will have to engage with and for which guidance and support will be needed.

5. Conclusion

The case for the inclusion of a digital learning component in the *Draft Primary Curriculum Framework* (NCCA, 2020) is amply supported by the literature and wider policy debates relating to children's engagement with digital technologies. Supporting safe, ethical and responsible technology use has never been more important and relevant to preparing children to meet the challenges of the modern world and to empowering them to be active and effective participants in digital societies. How this is achieved in terms of curriculum design and enactment is crucial, and places educationalists and school leaders in an important position of influence on the emerging digital agenda.

The following brief conclusions are offered as observations to support this important and influential role.

Firstly, the key concepts underpinning safe, ethical and responsible use of digital technology are broad-based in nature and thus lend themselves to a transversal curriculum treatment. The key competencies associated with *Being a digital learner* are such that they are relevant to all subject areas and all aspects of learning on the curriculum. The mapping of competencies contained within the *Council of Europe's Digital Citizenship Framework* can act as a cross-frame and a support for any subject area; be it creativity, being mathematical, communicating through languages, and so on. What is important in this context is that digital technology use and all of the dimensions that contribute to interacting safely, ethically and responsibly when using digital technologies are not treated in isolation or concentrated solely in one 'technology' subject area. When framed as a process of digital citizenship, they are qualities that contribute to any process of positive, critical and competent engagement in the learning process.

Secondly, more work is needed from a curriculum point of view to clearly define and develop the appropriate learning resources needed for the range of competencies that safe, ethical and responsible technology use entails. This, as outlined above, encompasses skills,

knowledge, values, attitudes and critical understanding that lends itself to a cross-curricular approach but needs to be tailored to children of different ages, cultures and abilities. This is a major task and, as recently argued by the OECD, needs to be supported by high-quality and rigorous research on children's wellbeing and digital technology use (Burns & Gottschalk, 2019).

Thirdly, it is also important to remember that children's technology use is primarily associated with fun and free play. Engaging children as digital learners should be careful not to undermine this crucial aspect of their digital experience and should seek to support their creativity, curiosity and inventiveness in the use of technologies in learning settings. This is central to developing children's multimodal literacies as a fundamental part of their educational experience (Sefton-Green et al., 2016).

Finally, using digital technology safely, ethically and responsibly should be regarded as a skill for lifelong learning whereby everyone is empowered to engage competently with digital technologies and supported to participate actively and positively in societies that are increasingly data-driven. The vision underpinning the *Draft Primary Curriculum Framework*, 'to provide a strong foundation for every child to thrive and flourish, supporting them in realising their full potential as individuals and as members of communities and society during childhood and into the future' (NCCA, 2020, p. 2), thereby acts as a stimulus for further awareness and debate across the entire education sector and a key reminder of safe technology use as a building block for the future.

References

Buckingham, D. (2010). Defining digital literacy. In Medienbildung in neuen Kulturräumen (pp. 59–71). VS Verlag für Sozialwissenschaften. https://doi.org/10.1007/978-3-531-92133-4_4

Burns, T., & Gottschalk, F. (2019). Educating 21st century children: Emotional well-being in the digital age. (T. Burns & F. Gottschalk, Eds.). Paris: Educational Research and Innovation, OECD Publishing, P. https://doi.org/doi.org/10.1787/b7f33425-en

Carretero, S.; Vuorikari, R. and Punie, Y. (2017). DigComp 2.1: The Digital Competence Framework for Citizens with eight proficiency levels and examples of use. Luxembourg, Publications of the European Union. https://doi:10.2760/38842

Chaudron, S., Di Gioia, R. & Gemo, M. (2018). Young children (0-8) and digital technology. Luxembourg, Publications of the European Union. https://doi.org/10.2760/294383

Council of Europe. (2017). Digital citizenship education. Volume 1: Overview and new perspectives. Strasbourg: Council of Europe.

Council of Europe. (2018). Recommendation CM/Rec(2018)7 of the committee of ministers to member states on guidelines to respect, protect and fulfil the rights of the child in the digital environment. Strasbourg: Council of Europe. Retrieved from: https://search.coe.int/cm/Pages/result_details.aspx?ObjectID=09000016808b79f7

Council of Europe. (2019). Recommendation CM/Rec(2019)10 of the committee of ministers to member states on developing and promoting digital citizenship education. Retrieved from: https://rm.coe.int/CoERMPublicCommonSearchServices/DisplayDCTMContent?documentId=090000168098de08

Council of the European Union. (2018). Council Recommendation of 22 May 2018 on key competences for lifelong learning: Key competences for lifelong learning, a European reference framework, Official Journal of the European Union. Retrieved from: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018H0604(01)&rid=7

CSO. (2020). Information society statistics - Households 2019. Retrieved July 8, 2020, from https://www.cso.ie/en/releasesandpublications/ep/p-isshh/informationsocietystatistics-households2019/

CyberSafeIreland. (2019). Annual report 2018-19. Dublin, CyberSafeIreland.

DCCAE. (2019). General Scheme of the Online Safety & Media Regulation Bill 2019. Retrieved from: https://www.dccae.gov.ie/en-ie/communications/legislation/Documents/154/General_Scheme_Online_Safety_Media_Regulation_Bill.pdf

DCYA. (2014). *Better outcomes, brighter futures: The national policy framework for children and young people 2014-2020*. Retrieved from: http://www.dcya.gov.ie/

DCYA. (2015). *National* youth strategy *2015–2020*. Retrieved from: https://www.dcya.gov.ie/documents/publications/20151008NatYouthStrat2015to2020.pdf

Department of Education and Skills. (2015). *Digital strategy for schools 2015-2020: Enhancing teaching, learning and assessment*. Retrieved from: https://www.education.ie/en/Publications/Policy-Reports/Digital-Strategy-for-Schools-2015-2020.pdf

Department of Education and Skills. (2017). *Digital learning framework for post primary schools, 17*. Retrieved from: https://www.education.ie/en/Schools-Colleges/Information/Information-Communications-Technology-ICT-in-Schools/digital-learning-framework-primary.pdf

ENOC. (2019). European Network of Ombudspersons for Children (ENOC) Position statement on

"Children's rights in the digital environment". Adopted by the 23 rd ENOC General Assembly, 27th September 2019 , Belfast. Retrieved from: http://enoc.eu/wp-content/uploads/2019/10/ENOC-2019-Statement-on-Childrens-Rights-in-the-Digital-Environment.pdf

European Commission. (1996). Green paper on the protection of minors and human dignity in audiovisual and information services COM(96) 483. Brussels.

European Commission. (2009). Assessment report on the status of online safety education in schools across Europe. Luxembourg.

European Commission. (2011). Pillar 6: Digital competence in the digital agenda. The Digital Agenda Scoreboard 2011. Brussels. Retrieved from: https://ec.europa.eu/digital-single-market/en/news/digital-agenda-scoreboard-2011

European Commission. (2012). European strategy for a better internet for children COM(2012)196. Brussels. Retrieved from: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2012:0196:FIN:EN:PDF

Eurostat. (2020). *Digital economy and society statistics - households and individuals.* Retrieved July 8, 2020, from https://ec.europa.eu/eurostat/statistics-explained/index.php/Digital_economy_and_society_statistics_-_households_and_individuals

Eurydice. (2010). Education on online safety in schools in Europe. Brussels.

Everri, M., & Park, K. (2018). *Children's online behaviours in Irish primary and secondary schools.* Dublin, Zeeko. Retrieved from: https://zeeko.ie/wp-content/uploads/2018/06/ZEEKO-TREND-REPORT-.pdf

Ferrari A., Punie Y., Redecker C. (2012) Understanding Digital Competence in the 21st Century: An Analysis of Current Frameworks. In: Ravenscroft A., Lindstaedt S., Kloos C.D., Hernández-Leo D. (eds) 21st Century Learning for 21st Century Skills. EC-TEL 2012. Lecture Notes in Computer Science, vol 7563. Springer, Berlin, Heidelberg. https://doi.org/10.1007/978-3-642-33263-0_7

Finkelhor, D., Walsh, K., Jones, L., Mitchell, K., & Collier, A. (2020). Youth Internet Safety Education: Aligning Programs With the Evidence Base. *Trauma, Violence, & Abuse.* https://doi.org/10.1177/1524838020916257

Frau-Meigs, D. (2012). Transliteracy as the new research horizon for media and information literacy. *Media Studies*, 3(6), 14–27.

Government of Ireland. (2018). *Action Plan for Online Safety 2018-2019*. Dublin. Retrieved from: https://www.gov.ie/en/campaigns/be-safe-online/

Grizzle, A., UNESCO, & United Nations. (2013). *Media and information literacy policy and strategy guidelines*. Paris. Retrieved from: http://unesdoc.unesco.org/images/0022/002256/225606e.pdf

Growing Up in Ireland. (2017). *Key findings: Infant cohort at 7/8 years. No. 3 Socio-emotional development, relationships and play*. Dublin. Retrieved from: http://www.esri.ie/pubs/GUI-KF-3.pdf

Holloway, D., Green, L., & Livingstone, S. (2013). *Zero to eight: Young children and their internet use*. London, LSE. Retrieved from: http://www.eukidsonline.net/

James, C., Davis, K., Charmaraman, L., Konrath, S., Slovak, P., Weinstein, E., & Yarosh, L. (2017). Digital life and youth well-being, social connectedness, empathy, and narcissism. *Pediatrics*, 140(Supplement 2), S71–S75. https://doi.org/10.1542/peds.2016-1758F

Jones, L. M., Mitchell, K. J., & Walsh, W. A. (2014). A content analysis of youth internet safety programs: Are effective prevention strategies being used? Retrieved from: http://scholars.unh.edu/ccrc/41/

Kerryann Walsh, Wallace, E., Ayling, N., & Sondergeld, A. (2020). Best *practice framework for online safety education*. Brisbane.

KiDiCoTi (2020). *Kids' digital lives in Covid-19 times: A comparative mixed methods study on digital practices, safety and wellbeing. Key findings from Ireland*. Dublin: Dublin City University. https://antibullyingcentre.b-cdn.net/wp-content/uploads/2020/08/Short-report_Covid_for-media.pdf

Livingstone, S., Haddon, L., Görzig, A., & Ólafsson, K. (2011). *Risks and safety on the internet: The perspective of European children. Full findings*. London, LSE.

Livingstone, Sonia, & Helsper, E. (2007). Gradations in digital inclusion: children, young people and the digital divide. *New Media Society*, 9, 671–696. Retrieved from: http://dx.doi.org/10.1177/1461444807080335

Lorenz, T., & Kapella, O. (2020). Children's ICT use and its impact on family life (DigiGen - Working paper series No. 1). Vienna. https://doi.org/10.6084/m9.figshare.12587975.v1

Nansen, B., Chakraborty, K., Gibbs, L., MacDougall, C., & Vetere, F. (2012). Children and digital wellbeing in Australia: Online regulation, conduct and competence. *Journal of Children and Media*, 6(2), 237–254. https://doi.org/10.1080/17482798.2011.619548

NCCA (2020). *Draft Primary Curriculum Framework*. Dublin, National Council for Curriculum and Assessment.

O'Neill, B. (2018). Research for CULT Committee – Child safety online: definition of the problem. Brussels. Retrieved from: http://www.europarl.europa.eu/RegData/etudes/IDAN/2018/602016/IPOL_IDA(2018)602016_EN.pdf

O'Neill, Brian, & Dinh, T. (2014). *Net children go mobile. Initial findings from Ireland.* Dublin. Retrieved from: http://www.netchildrengomobile.eu/wp-content/uploads/2013/07/NCGM_Ireland_initialfindingsreport_complete_new-1.pdf

O'Neill, B., & Dinh, T. (2015). *Net children go mobile*: Full findings from Ireland. Dublin. Retrieved from: http://arrow.dit.ie/cserrep/55

O'Neill, B., & Dinh, T. (2018). *The better internet for kids policy Map: Implementing the European strategy for a better internet for children in European member states*. Brussels. Retrieved from: https://www.betterinternetforkids.eu/

O'Neill, B., & Laouris, Y. (2013). Teaching internet safety, promoting digital literacy: the dual role of education and schools. In B. O'Neill, E. Staksrud, & S. McLaughlin (Eds.), *Towards a better internet for children? Policy pillars, players and paradoxes*. Goteborg: Nordicom, UNESCO International Clearinghouse for Children, Youth and Media.

O'Neill, B., Livingstone, S., & McLaughlin, S. (2011). Final recommendations for policy, methodology and research. London, LSE.

OECD. (2012a). *Connected minds*. Paris, Organisation for Economic Co-operation and Development. https://doi.org/10.1787/9789264111011-en

OECD. (2012b). Protection of children online. Report on risks faced by children online and policies to protect them. Paris, Organisation for Economic Co-operation and Development. Retrieved from: http://dx.doi.org/10.1787/5kgcjf71pl28-en

OECD. (2018). Preparing our youth for an inclusive and sustainable world. The OECD PISA global competence framework. Paris, Organisation for Economic Co-operation and Development. https://doi.org/10.1074/jbc.M801892200

Ólafsson, K., Livingstone, S., & Haddon, L. (2014). Children's use of online technologies in Europe: A

review of the European evidence base. LSE, London: EU Kids Online (Vol. 2014).

PDST & Webwise. (2020). *Connected. An introduction to digital media literacy. an introduction to digital media*. Dublin, The Professional Development Service for Teachers. https://doi.org/10.4324/9780203398401

Programme for Government—Our Shared Future. (2020). Dublin. Retrieved from: https://static.rasset.ie/documents/news/2020/06/draft-programme-for-govt.pdf

Ribble, M. S., Bailey, G. D., & Ross, T. W. (2004). Digital citizenship: Addressing appropriate technology behavior. *Learning & Leading with Technology*, 32(1), 6. https://doi.org/10.1002/asi.20906

Sefton-Green, J., Marsh, J., Erstad, O., & Flewitt, R. (2016). Establishing a research agenda for the digital literacy practices of young children: A white paper for COST action IS1410. Retrieved from: http://digilitey.eu/wp-content/uploads/2015/09/DigiLitEYWP.pdf

Smahel, D., Machackova, H., Mascheroni, G., Dedkova, L., Staksrud, E., Ólafsson, K., Livingstone, S.,

and Hasebrink, U. (2020). EU Kids Online 2020: Survey results from 19 countries. EU Kids Online.

https://doi.org/10.21953/lse.47fdeqj01ofo

UKCIS. (2020). Education for a *connected world*—2020 edition. London, UK Council for Internet Safety.

UN Committee on the Rights of the Child (CRC). (2014). Report of the 2014 day of general discussion "Digital *media and children's rights."* Retrieved from: http://www.ohchr.org/Documents/HRBodies/CRC/Discussions/2014/DGD_report.pdf

UNESCO. (2015). *Fostering digital citizenship through safe and responsible use of ICT: A review of current status in Asia and the Pacific as of December 2014*. UNESCO Bangkok.

UNESCO. (2018). *UNESCO ICT competency framework for teachers*. Paris: UNESCO.

UNICEF. (2017). The *state of the world's children* 2017. Children in a *digital world*. New York N.Y. Retrieved from: https://www.unicef.org/publications/files/SOWC_2017_ENG_WEB.pdf

Walsh, K, Wallace, E.,Ayling, N., and Sondergeld, A. (2020). Best practice framework for online safety education (Stage 1). eSafety Commissioner, Australia. Retrieved from: https://eprints.qut.edu.au/202958/

Williams, J., Greene, S., Doyle, E., Harris, E., Layte, R., McCoy, S., & Al, E. (2009). *Growing up in Ireland national longitudinal study of children: The lives of 9-year-olds. Report 1*. Dublin.

Useful resources

The **Council of Europe** has a range of materials and information available related to digital citizenship education. In particular, the following are relevant to the issues raised in this paper:

- The website for the Council of Europe Digital Citizenship Education project provides information and knowledge about the project and supports discussion and experience sharing. Available at: https://www.coe.int/en/web/digital-citizenship-education/
- The Digital Citizenship Education Handbook (2019) is intended for teachers and parents, education decision makers and platform providers alike. It describes in depth the multiple dimensions that make up each of 10 digital citizenship domains, and includes a fact sheet on each domain providing ideas, good practice and further references to support educators. Available at: https://rm.coe.int/16809382f9

The **Better Internet for Kids** core service platform (https://www.betterinternetforkids.eu/) is supported by the European Commission and acts as a one-stop shop for information resources on online issues for children and young people in a European context. Its aim is to foster the exchange of knowledge, expertise, resources and best practices between key online safety stakeholders, including industry, in order to increase access to high-quality content for children and young people, step up awareness and empowerment, create a safe environment for children online, and fight against child sexual abuse and child sexual exploitation. The platform is maintained by European Schoolnet on behalf of the European Commission.

BeSafeOnline (https://www.gov.ie/en/campaigns/be-safe-online/) is the government's campaign to highlight ways to help citizens to stay safe online. The website provides access to a wide range of online safety resources, to support online safety for all.

Webwise.ie (https://www.webwise.ie/) : Webwise is the Irish Internet Safety Awareness Centre which is co-funded by the Department of Education and Skills and is co-financed by the European Union's

Connecting Europe Facility. Webwise is part of the PDST Technology in Education, which promotes and supports the integration of ICT in teaching and learning in first- and second-level schools. It provides extensive resources for teachers, parents and young people, including a range of dedicated educational and classroom materials to support online safety and digital citizenship education.

Children Online: Research and Evidence (https://core-evidence.eu/) CO:RE—Children Online: Research and Evidence is a comprehensive pan-European knowledge platform with the participation of international researchers, educators, policy makers and concerned dialogue groups. Providing an overview of the research situation, enabling access to empirical data, distributing policy recommendations and offering resources for education are the main features of the platform.