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Turning ySKILLS recommendations into action points for EU policy on children's digital skills

Argyro Chatzinikolaou
Eva Lievens
Benedetta Venturato
Marta Lamanuzzi
Claudia Mazzucato

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Turning ySKILLS recommendations into action points for EU policy on children's digital skills

Work Package 7 – Deliverable 7.4

Authors: **Argyro Chatzinikolaou, Eva Lievens, Benedetta Venturato, Marta Lamanuzzi, Claudia Mazzucato**

European Commission

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Executive summary

Is the current policy at the level of the European Union (EU) adequate to promote youth's digital skills and wellbeing in the digital environment? Which action does the evidence suggest is needed to improve the digital skills of European children? In this report we offer EU policymakers key action points on how to best ensure and promote children's digital skills based on ySKILLS results.

This report presents the analysis carried out in Task 7.4 within Work Package 7 of the ySKILLS project. It aims to translate the ySKILLS policy recommendations formulated within Task 7.3 into action points addressed to EU policymakers.

The research was carried out in three stages. The first stage involved mapping and describing the existing EU framework, which holds potential relevance for ySKILLS. This comprehensive analysis encompassed four key facets: (1) delineating the competences of the EU; (2) scrutinising the existing EU policies, (3) assessing EU legislation, and (4) identifying the EU bodies responsible for providing advice, taking measures or supervising matters in relation to youth's digital skills and wellbeing in the digital age. Second, the policy recommendations derived from ySKILLS findings in Task 7.3 were mapped onto the EU framework and a gap analysis was carried out. In the third stage, specific action points were formulated to implement the ySKILLS recommendations to advance youth's digital skills and wellbeing in the digital age.

Appointment of an EU youth Digital Skills Coordinator

Based on our analysis, several notable trends were identified. First, **increasing attention** has been devoted to children's empowerment and safe participation in the digital environment within various EU policy initiatives and instruments, both in areas where the EU has supporting (education, youth) and shared competences (internal market, justice, consumer protection). A common objective observed across EU policy is the cultivation of resilience and the enhancement of digital skills as a way to mitigate online risks and actively participate in the digital environment. Numerous policy documents contain elements that might contribute to the strengthening of digital skills, along with important commitments in relation to children and their acquisition or enhancement of digital skills. Notably, the European Declaration on Digital Rights and Principles for the Digital Decade and the Better Internet for Kids+ Strategy exemplify such commitments. At the same time, it has proven to be a complex endeavour to gain and maintain a comprehensive overview of all initiatives, as they are taken across various policy areas, by different directorate-generals, each with their unique focus (e.g., workforce-specific or targeting citizens in general). In order to increase coordination, the EU could consider appointing a **youth Digital Skills Coordinator** tasked with overseeing initiatives across different policy areas, directorate-generals and instruments, thereby promoting a more cohesive and effective approach to youth's digital skills development.

Implementation of the youth Digital Skills Indicator (yDSI) for a more holistic approach to digital skills

Second, across policies, there is some – but overall still limited – attention given to the **diversity** of children and the factors that affect their **vulnerabilities**. The same applies to the different dimensions of digital skills. In recent policy documents, references to critical thinking skills (especially in relation to disinformation) are prevalent, but skills in relation to communication and content creation receive much less attention. The adoption and implementation of the **youth Digital Skills Indicator** (yDSI) could be a valuable guide. At the same time, future development and fine-tuning of the yDSI should

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be invested in, especially in light of new technological developments which may impact the dimensions of digital skills and, hence, may require new tools to measure digital skills.

Close cooperation between the EU and Member States on digital education and skills

Third, many policy initiatives have been set up in relation to digital education in recent years. Whereas some of these initiatives focus on education in relation to employment, others do refer to digital skills in **school curricula** and **training of teachers**. As education falls within the supporting competences of the EU, it is not possible to enact legislation to, e.g., harmonise national school curricula. The scope of action is therefore limited to providing guidance and stimulating action at national level, for instance, through the sharing of best practices and promoting whole-of-government approaches. In this regard, **close cooperation between EU and Member States**, for instance through the Structured Dialogue with Member States on digital education and skills, is crucial.

Focus on implementation and enforcement of (recently) adopted legislative instruments

Fourth, there is an increasingly strong legislative framework, with a panoply of EU **legislative instruments** that have been adopted in recent years that might affect children in their relation to the digital environment. Instruments such as the General Data Protection Regulation (GDPR) and the Digital Services Act (DSA) impose obligations to ensure that children's data subject rights are respected, that they encounter less illegal and harmful content or disinformation online, and are not the victim of illegal acts or unfair or manipulative practices. Although these instruments are not focussed on the promotion of digital skills, certain obligations that are imposed on businesses assume that users have digital skills. For mechanisms such as tools to report illegal or harmful content or privacy settings to be meaningful, children must have the skills to use them. This means that digital skills education must take into account the skills needed to effectively use the legislative mechanisms that are available to children. Whether the intended impact of the legislative instruments will materialise, will need to be **monitored** very closely. Most instruments have been adopted or put into practice quite recently, so both **implementation and enforcement** are still in their early stages. Enforcement is crucial, and the **regulatory authorities** that are tasked with enforcement must be encouraged to take up their responsibility.

Involvement of stakeholders, including children, in promoting children's digital skills

Fifth, promoting and enhancing children's digital skills requires the involvement of a diverse array of **stakeholders**. Several entities at the EU level, such as **regulatory, expert or working groups, coalitions and observatories**, as well as **regulatory authorities** at the national level, can play a pivotal role in the communication of policies on digital skills, their different dimensions and factors that may give rise to vulnerabilities. The involvement of **media and industry actors** is equally crucial as these stakeholders should be enlisted to heighten awareness on digital skills and must be furnished with guidance on how to take children's digital skills levels into account when designing their services, for instance in the context of the forthcoming Age-Appropriate Design Code. In addition, it is imperative to actively engage **children** themselves in the (co-)creation and dissemination of policies that affect the promotion and enhancement of their digital skills. This aligns with the emphasis on participation of children in political and democratic life in the EU Strategy on the rights of the child and would be in line with recommendations by the UN Committee on the Rights of the Child, in their General Comment on the Rights of the Child in the Digital Environment.

Investment in more structural, longitudinal and cross-EU research into children's digital skills

Finally, the EU has established a framework for promoting and funding **research** that informs policymaking. Within this framework, research projects focused on or related to children's digital skills and wellbeing in the digital environment have received EU funding. Besides contributing to the understanding of the link between children's skills and wellbeing as they navigate the digital environment, such projects all underscore the need for further research and evidence-based knowledge in this domain. Calls for additional research and evidence-based knowledge on children and the digital environment (be it in relation to their wellbeing, skills, online risks and opportunities) also recurrently appear in policy instruments. As ySKILLS provides for a validated youth Digital Skills Indicator, and methodologies for measurement (surveys, performance tests, fMRI tests), a policy decision should be considered to invest in more **structural, longitudinal and cross-EU research which implements and keeps the yDSI up to date** in order to measure children's digital skills over time and across various geographical regions.

Building on our analysis, we have translated the ySKILLS policy recommendations into a number of action points addressed towards EU policymakers. While a consensus is emerging at international and European level to put the promotion and strengthening of digital skills on top of the policy agenda, the European Union can take up a **leading role** in this area. This requires a conscious choice to invest in the future of today's children, who grow up in a digital world.

ySKILLS Action Points

Conceptualisation, measurement and research

- Invest in structural, longitudinal and cross-EU research which implements the yDSI to measure the different dimensions of children's digital skills over an extended period and across various geographical locations.
- Invest in the future development and fine-tuning of the yDSI, especially in light of new technological developments which may impact the dimensions of digital skills.

Policies

- Appoint a yDSC: a youth Digital Skills Coordinator to oversee and coordinate initiatives regarding children's digital skills across various policy areas, directorate-generals, and instruments.
- Incorporate the granularity of the different dimensions of digital skills and vulnerabilities in EU policy on children's digital skills.
- Foster close cooperation with Member States to ensure the effective implementation of EU policies in the area of education and youth (supporting competences) at national level, for instance through the Structured Dialogue with Member States on digital education and skills.
- Monitor the progress and implementation of commitments outlined in the Declaration on Digital Rights and Principles in the Digital Decade.

Regulation

- Prioritise enforcement of the legislative framework, as proficiency in digital skills is insufficient to address certain online risks for children. It is imperative that companies design their services in a way that effectively mitigates these risks.
- Invest in the continuous monitoring and evaluation of the effectiveness of the current policy and legislative framework that might affect children's digital skills (even indirectly).
- Provide guidance on digital skills education that includes the necessary skills for effectively using legislative mechanisms such as privacy settings and reporting mechanisms, which are available to children to exercise their rights in the digital environment.

Communication and stakeholders

- Identify the relevant EU-level bodies that can actively participate in awareness-raising of policies on children's digital skills, and their different dimensions.
- Engage with industry stakeholders to promote and enhance the different dimensions of children's digital skills. This could encompass instructing children on the use of privacy settings, reporting mechanisms, complaints or other remedies, or the identification of disinformation (for instance, in the context of the Age Appropriate Design Code).
- Engage with children to (co-)create and communicate policies that affect the promotion and enhancement of their digital skills.

1. The ySKILLS project

> **The overarching aim of ySKILLS**
>
> To enhance and maximise the long-term positive impact of the ICT environment on multiple aspects of wellbeing for all children by stimulating resilience through the enhancement of digital skills.

The ySKILLS (Youth Skills) project is funded by the European Union's (EU) Horizon 2020 Research and Innovation programme. It involves 16 partners from 13 countries. The aim of the project is to enhance and maximise the long-term positive impact of the information and communication technology (ICT) environment on multiple aspects of wellbeing for children and young people by stimulating resilience through the enhancement of digital skills.

Starting from the view that children and young people are active agents in their own development, ySKILLS examines how digital skills mediate the risks and opportunities related to ICT use by 12- to 17-year-olds in Europe (see Figure 1 and www.ySKILLS.eu). Throughout the project ySKILLS has identified the actors and factors that undermine or can promote children and young people's well-being in a digital age. The relations between ICT use and wellbeing have been critically and empirically examined over time.

> **ySKILLS' research objectives**
>
> - To acquire extensive knowledge and better measurement of digital skills.
> - To develop and test an innovative, evidence-based explanatory and foresight model predicting the complex impacts of ICT use and digital skills on children's cognitive, physical, psychological and social well-being.
> - To explain how at-risk children (as regards their mental health, ethnic or cultural origin, socioeconomic status and gender) can benefit from online opportunities despite heir risk factors (material, social, psychological).
> - To generate insightful evidence-based recommendations and strategies for key stakeholder groups in order to promote European children's digital skills and well-being.

Figure 1

New theoretical model that displays relations of digital skills to other concepts
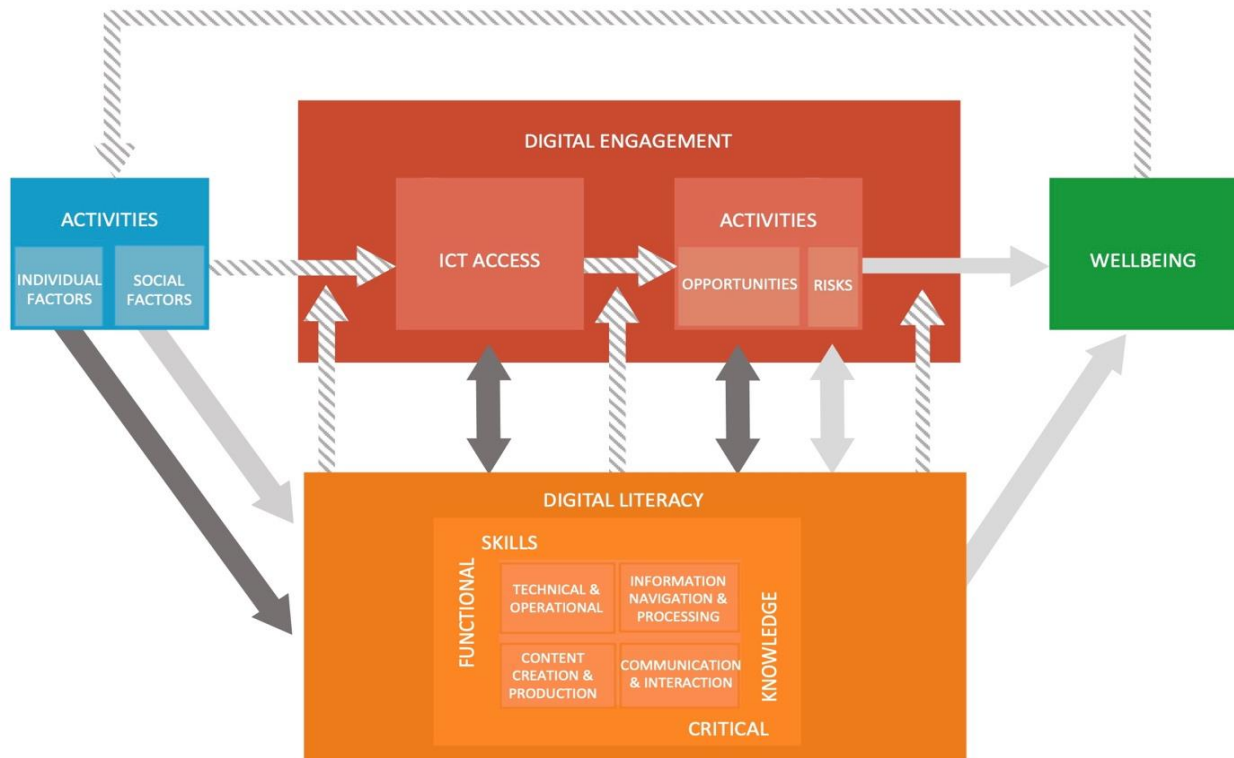
Source: Šmahel, D., Mascheroni G., Livingstone, S., Helsper, E., van Deursen, A.J. A.M., Tercova, N., Stoilova, M., Georgiou, M. A., Machackova, H., & Alho, K. (2023). *Theoretical Integration of ySKILLS: Towards a New Model of Digital Literacy.* KU Leuven: ySKILLS. (Deliverable 2.3)

2. The report

2.1 The aim and structure of this report

This report presents the analysis carried out in Task 7.4 of Work Package 7. It aims to map the set of policy recommendations addressed to the EU legislators and policymakers that are formulated in D7.3 (*ySKILLS – Children and young people (aged 12-17)'s Digital Skills: Evidence-based recommendations for policy and practice*; Ní Bhroin et al., 2023) and are based on the research findings of ySKILLS, onto the European Union (EU) legal and policy frameworks that are in place and to subsequently identify potential gaps within the existing framework.

This analysis of the evidence-based recommendations aims to contribute to the formulation of action points for EU policy makers that, in turn, aim to advance children's digital skills and wellbeing in the digital environment . The report builds on the work carried out in previous tasks of Work Package 7, which include a synthesis of the findings of all preceding ySKILLS work packages (task 1) and the identification of policy recommendations that emerge from the ySKILLS findings (task 3). In addition, the present analysis refers to ySKILLS findings presented within previous Work Packages.

The research within Task 7.4 was carried out in three stages:

- The first stage encompassed a mapping and description of the EU framework that is currently in place and is potentially relevant to ySKILLS. Adopting a doctrinal legal approach, this analysis identified (1) the competences of the EU, (2) existing EU policies and (3) EU legislation, and (4) the EU bodies that are responsible to provide advice, take measures or supervise matters in relation to youth's digital skills and wellbeing in the digital age.

- Second, the policy recommendations derived from ySKILLS' findings in Task 7.3 were mapped onto the EU framework, and a gap analyisis was carried out. This entailed the clustering of the ySKILLS recommendations into themes, and subsequently, an assessment of the extent to which the ySKILLS recommendations fall within EU competence domains, whether they are already incorporated within existing policies or legal instruments, and which EU bodies are responsible to take action for their operationalisation (in case they are not already in place) or to supervise their implementation.

- In the third stage, this gap analysis led to the formulation of action points that indicate which action should be taken by EU policymakers to implement the ySKILLS recommendations to advance youth's digital skills and wellbeing in the digital age.

To this end, Section 3 of the report presents the competences of the EU that are relevant to ySKILLS and discusses the limits of action that the EU can take towards the advancement of children's digital skills and wellbeing in the digital environment. Second, Section 4 presents a comprehensive mapping of the ySKILLS policy recommendations onto the current EU policy and legal framework. Finally, Section 5 summarises the key findings of the gap analysis and puts forward concrete and specific action points directed at EU policymakers.

2.2 Definitions

In this report, the following terms are defined as follows:

Children, young people and youth: A *child* is defined as a person under the age of 18, in accordance with Article 1 of the UN Convention on the Rights of the Child (UNCRC). *Young people* (or *youth*) – defined as 15-24 years old, following the United Nations – overlaps with the later stages of childhood and adolescence and includes the transition to training, further education or employment. ySKILLS specifically focuses on those aged 12-17, although certain studies also included participants aged 18-22. In this report the focus is on the current EU framework relevant to children and digital skills.

Competence: This notion refers to the competence of the EU, meaning its powers to act. The EU may only act within the limits of the competences transferred to or conferred upon it by the EU Member States in the Treaties to attain the Treaties' objectives (Publications Office of the European Union, 2022). Competences which have not been transferred in the Treaties remain with the Member States.

Digital skills: Building on the International Telecommunication Union's definition, ySKILLS recognises that digital skills are both functional and critical, encompassing "the abilities needed to engage with technology in ways that allow people to shape as well as use digital platforms and

environments, building on knowledge about why ICTs do what they do and what the consequences of this for individuals and society might be" (Šmahel et al., 2023). ySKILLS distinguishes four dimensions of digital skills (technical and operational, information navigation and processing, communication and interaction, and content creation and production). Combined with digital knowledge, these comprise digital literacy.

Digital environment: This is constantly evolving and expanding, encompassing diverse information and communications technologies, and including digital networks, content, services and applications, connected devices and environments, automated systems, algorithms, and so forth.

2.3 Terminology

Our analysis of the EU framework has revealed that in policy documents and legislation, different notions are used, sometimes in an interchangeable manner, to refer to literacy (or literacies) and skills in relation to media and digital technologies. Notions that are used include media literacy, media literacy skills, digital literacy, digital skills, and digital competences. Whereas ySKILLS posits that digital literacy consists of digital skills and digital knowledge, in this report we use and refer to the notions as they are used in the documents that are the subject under study.

3. Competences of the EU relevant to ySKILLS

3.1 Division of competences within the EU

The power of EU policymakers to take action is associated with the notion of "competence(s)". Within the European Union, the allocation of competences is based on the principle of conferral, enshrined in Article 5 of the Treaty on European Union (TEU). This principle dictates that the EU can only take action within the boundaries of the competences conferred upon it by the Member States in the EU Treaties. Competences that are not conferred upon the EU remain with the individual Member States. Any action taken by the EU ought to be founded upon a legal basis included in the EU Treaties. This legal foundation not only establishes the scope of EU competence but also determines how it can be exercised. The competences of the EU, which are subject to the principles of subsidiarity[1] and proportionality[2] (TEU, Article 5 paragraph 1), can be categorised as either **exclusive** or **non-exclusive**. The non-exclusive competences are further divided into **shared** and **supporting** competences. The division of competences is laid down in Articles 2 through 6 of the Treaty on the Functioning of the EU (TFEU).[3]

1.   Article 3 of the TFEU lists the areas in which the EU has **exclusive competence**. In this case, only the EU is in the position to legislate and adopt binding acts, whereas Member States are able to do so themselves insofar as they are given powers by the EU to implement these acts. Moreover, the EU has an exclusive competence to conclude international agreements under certain conditions.

2.   Article 4 of the TFEU lists the most important areas in which **competence** is **shared** between the EU and the Member States, and hence both are able to legislate and adopt legally binding acts. Within these areas, Member States exercise their own competence where the EU does not exercise, or has decided not to exercise, its own competence.

3.   Article 6 of the TFEU lists the areas in which the **competence** of the EU is **supporting**. Within these areas, the EU can only intervene to support, coordinate, or complement the action of its Member States. Its acts may not entail harmonisation of Member States' laws or regulations (Lenaerts & Van Nuffel, 2022).

4.   In addition, Article 5 describes the special competence of the EU to provide arrangements within which EU Member States must **coordinate** policy in the areas of economic, employment, and social policies.

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[1] According to the principle of subsidiarity, enshrined in Article 5(3) of the TFEU, in areas that do not fall within its exclusive competence, the EU shall not act unless the objectives of the proposed action cannot be sufficiently achieved by the Member States, by reason of the scale or effects of the proposed action, and may be better achieved at EU level.

[2] According to the principle of proportionality, enshrined in Article 5(4) of the TEU, the content and form of Union action shall not exceed what is necessary to achieve the objectives of the Treaties.

[3] Article 4 TFEU presents the most important areas of shared competence between the EU and the Member States by means of a non-exhaustive list. The TFEU does not specify the classification of the policy areas mentioned in Article 5, however, according to literature, they best qualify as areas of shared competence between the EU and the Member States (Lenaerts & Van Nuffel, 2022).

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3.2 Competences of the EU relevant to the advancement of youth's digital skills and wellbeing in the digital age

Based on the EU Treaties and the allocation of competences, it can be argued that any action the EU may take in relation to the advancement of youth's digital skills and wellbeing in the digital age falls into either **shared competence** with the Member States (where legislative harmonisation is possible) or **supporting competence** directed towards the Member States (where legislative harmonisation is not possible).

Table 1 *EU Competences*

Exclusive competences	Shared competences	Competences to carry out actions to support, coordinate, or supplement the actions of Member States
Customs union	Internal market	Protection and improvement of human health
The establishing of competition rules necessary for the functioning of the internal market	Social policy (but only for aspects specifically defined in the treaty)	Industry
Monetary policy for euro-area countries	Economic, social, and territorial cohesion (regional policy)	Culture
Conservation of marine biological resources under the common fisheries policy	Agriculture and fisheries (except conservation of marine biological resources)	Tourism
Common commercial policy	Environment	Education, vocational training, youth and sport
	Consumer protection	Civil protection
	Transport	Administrative cooperation
	Trans-European networks	
	Energy	
	Area of freedom, security and justice	
	Common safety concerns in public health matters (limited to the aspects defined in the TFEU)	
	Research, technological development and space*	
	Development cooperation and humanitarian aid*	
	Coordination of economic policies	
	Coordination of employment policies	
	Coordination of social policies	
	Definition and implementation of a common foreign and security policy	

* These are so-called "parallel" competences, which means that the exercise of these competences by the Union "shall not result in Member States being prevented from exercising theirs".

Colour codes: Competences highlighted in dark orange are the ones that are most closely linked to the ySKILLS project, light orange indicates a potential, but weaker link.

As visualised in the table, the EU primarily holds a supporting or coordinating role in matters related to health, education, and youth. Consequently, legislative authority in these areas mainly lies with the individual Member States. Within the areas of supporting competences, the EU may carry out actions to support, coordinate or supplement the Member States but cannot override their authority (Garben & Govaere, 2017; Lenaerts & Van Nuffel, 2022). This means that the Union may take action, but cannot impose harmonisation of Member States' laws or regulations (TFEU, Article 2). Measures adopted by the EU within the area of supporting competences may not restrict the Member States' power to regulate. However, the EU has the capacity to encourage or complement measures taken at national level, for example by adopting incentives or other specific measures, and by formulating recommendations. In these fields, important policy instruments have been adopted that will be discussed in the next section.

Youth's wellbeing and digital skills may be also impacted by acts concerning justice, the internal market, consumer protection, technological development, and social policy, which are fields in which the EU has **shared competence**. In areas of shared competence, both the EU and individual Member States have the authority to legislate and adopt legally binding acts, including acts that entail harmonisation of Member States' laws or regulations (Garben & Govaere, 2017; Lenaerts & Van Nuffel, 2022). According to Article 2(2) of the TFEU, Member States may exercise their competences to the extent that the EU has decided not to exercise its competence in those specific areas. In cases of conflicting measures, EU measures overrule national rules insofar as the EU has exercised its competence. In these domains, important legislative instruments have been adopted that will be discussed in the next section.

3.3 Legal Acts of the European Union

Within the designated areas of competence, and to exercise its competences, the EU can adopt certain instruments. Such acts can be either **legally binding** or **non-binding**. According to Article 288 of the TFEU, the EU institutions may adopt the following five types of acts:

Table 2

Legally binding or non-binding EU acts

Legally binding acts	Regulations
	Directives
	Decisions
Non-binding acts	Recommendations
	Opinions

As described in Article 288 of the TFEU

- a **regulation** shall have general application, it shall be binding in its entirety and directly applicable in all Member States;

- a **directive** shall be binding, as to the result achieved, upon each Member State to which it is addressed, but shall leave to the national authorities the choice of form and methods;

- a **decision** shall be binding in its entirety; a decision which specifies those to whom it is addressed shall be binding only to them;

- **recommendations** and **opinions** shall have no binding force.

In addition to the legal acts enumerated in Article 288 of the TFEU, guidance towards the Member States within the areas of designated EU competences is provided by the EU institutions also by means of non-binding (policy) documents. Article 290 of the TFEU introduces the possibility for the European legislator to delegate to the Commission the power to adopt non-legislative acts of general scope which supplement or amend non-essential elements of legislative acts. Such examples[4] are: interinstitutional agreements, resolutions, conclusions, communications, green papers and white papers, EU guidelines or strategies (issued in the form of EU Commission communications and addressed towards other EU institutions) or declarations adopted by the EU Commission and aimed at offering policy makers (and/or other parties, such as the industry) further guidance and clarification on EU law and policy (Publications Office of the European Union, 2017).

Key considerations

Health, education, and youth are domains in which the EU only has supporting competence. Hence, the regulation of these areas falls within the competence of the Member States. However, to some extent, certain activities impacting youth and digital skills are and may be further affected by acts regulating the internal market, consumer protection or technological development and social policy, all fields in which the EU has shared competences and can adopt legally binding acts.

Where the EU has shared competence, it can legislate and adopt legally binding acts, including acts that entail harmonisation of Member States' laws or regulations. Where the EU holds only supporting competence, the adoption of policies that provide guidance to Member States (through communications, action plans, or agendas) is possible. However, it cannot introduce acts that entail harmonisation of Member States' laws and regulations.

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[4] The listed examples are not exhaustive.

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4. Mapping ySKILLS policy recommendations onto the existing EU regulatory framework

Task 7.3 of the ySKILLS project presents a set of evidence-based recommendations for policy and practice to guide the process towards safer and more beneficial use of digital technologies by children and young people (Ní Bhroin et al., 2023). The recommendations have been developed on the basis of a synthesis of results of the ySKILLS project, as well as direct input from specific stakeholder groups. The aim of these recommendations is to provide guidance on how policy and practice can be developed to ensure safer and more beneficial use of digital technologies by children and young people.

ySKILLS Recommendations for EU policymakers

The twelve ySKILLS policy recommendations outlined in Task 7.3, which will be discussed in detail in the following section, call for the European Union to:

Ensure young people have safe and equal access to opportunities to develop digital skills

1. Ensure and monitor the implementation of a cohesive, coordinated European strategy for the development of digital skills to provide equal access and opportunities for all children and young people, recognising their diversity in terms of gender, age and cognitive abilities, as well as their potential vulnerabilities.
2. Strengthen the focus on developing children and young people's digital skills on the policy, research, and public agenda. This will help strike a balance between protecting children and young people from online risks and enabling their active participation in society. Such a focus ensures that children and young people's engagement in digital environments enhances their overall cognitive, psychological, physical and social wellbeing.
3. Ensure the implementation of an efficient and sustainable pan-European policy framework that recognises and addresses factors that can influence and cause vulnerabilities amongst children and young people. These include low socioeconomic status, poor or fair self-reported health, low academic performance, perceived discrimination, low self-efficacy, low family and peer support, and restrictive parental mediation (i.e. the extent to which parents restrict their children's use of the internet).
4. Ensure that these policies are communicated to the intended stakeholder groups, i.e. educational authorities, parents, children and young people, etc..

Ensure coherent approaches to support the development of children and young people's digital skills

5. Ensure coherent European educational policies and practices to enhance digital skills, including quality training opportunities for teachers and other professionals working with children and young people.
6. Prioritise the development of strategies to enhance dimensions of digital skills that are found to be less well developed amongst children and young people. Higher levels of digital skills in general are associated with more exposure to risky and potentially harmful online content, however links to harmful outcomes are unclear. At the same time, children and young people participating in the ySKILLS project record lower levels of information navigation and processing skills. These skills are also found to decrease risks of experiencing cyberhate content.

Ensure consistency in the conceptualisation and measurement of young people's digital skills and in the strategies implemented to enhance opportunities to develop these skills in practice. This entails:

7. Acknowledge the different dimensions of digital skills as conceptualised by ySKILLS (i.e. technical and operational skills, information navigation and processing skills, communication and interaction skills, and content creation and production skills). Recognise that children and young people develop these dimensions in various ways and that their development is influenced by a range of individual, social, and contextual factors.

8. Integrate the dimensions and measurements outlined in the ySKILLS project (i.e. the youth Digital Skills Indicator "yDSI"), with existing instruments such as DIGCOMP, PISA, and DESI to strengthen the conceptual basis, measurement, and evaluation of the quality and level of digital skills among children and youth in all EU/EEA countries. Use these evaluations to adjust evidence-based policy and initiatives that aim to promote digital skills.

Implement regulation to enhance the positive outcomes of digital media use for children and young people's wellbeing. This involves:

9. Enforce and monitor the provisions of current legislation, including the Digital Services Act, to curb excessive risks posed to young people's safety and wellbeing by the actions of commercial providers of digital products and services, especially global media and communication platforms.

10. Involve relevant media and technology industry partners in the promotion of all dimensions of digital skills, including technical and operational skills (specifically privacy management) and information navigation and processing skills, among the broader public.

11. Monitor and evaluate the implementation of the General Data Protection Regulation to ensure the protection of data and privacy of young people.

Continue to promote support for research to investigate the development of young people's digital skills as these are influenced by ongoing social and technological developments, such as the current increasing diffusion of AI.

12. Design, fund and implement pan-European research programmes to ensure a robust and methodologically diverse knowledge base (accounting for the differences in results when measuring skills according to different methods such as self-perception, performances tests and fMRI) to inform policy making and support the development of children and young people's digital skills.

In what follows, the recommendations are examined in light of the existing policy and legislative framework at the EU level in order to detect the extent to which the formulated recommendations on the basis of ySKILLS findings are already addressed or whether there are still gaps that require attention and amendments in the EU regulatory framework.[5]

For the purpose of mapping the twelve ySKILLS policy recommendations on the EU framework, the recommendations have been **categorised thematically** according to how they serve the overarching aim of ySKILLS.

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[5] A full list of references of all EU legally binding or non-legally binding instruments and initiatives is included in the "References" section of the Report.

A thorough examination of the entire set of recommendations for EU policymakers has led to the identification of five overarching themes:

- **Conceptualisation and measurement of digital skills**
- **Policies**
- **Regulation**
- **Communication & stakeholders**
- **Research**

4.1 Conceptualisation and measurement of digital skills

Recommendations 7 and 8, as they appear in the set of recommendations towards EU policymakers extracted from D 7.3, pertain to the **conceptual understanding and measurement** of children's digital skills and, more specifically, refer to the dimensions of digital skills identified within ySKILLS.

At the EU level, a variety of indicators and instruments have been developed and employed to measure digital skills and competences. A prime example is the **DigComp Framework**. This framework identifies the **key components of digital competence** in the following five areas: Information and data literacy, Communication and collaboration, Digital content creation, Safety, and Problem solving. The DigComp framework is **aimed at citizens in general, not children in particular.** While it is mainly used in relation to digital competences and employability, it can also be used in the **context of learning**. Another knowledge- and skills-related measurement instrument is the Programme for international Student Assessment (PISA), designed to evaluate the skill levels of 15-year-olds. Finally, since 2014, Member States' digital progress has been monitored through the Digital Economy and Society Index (DESI). None of these instruments have been developed specifically for measuring the different dimensions of digital skills of children and young people.

The **youth Digital Skills Indicator**, developed within ySKILLS, is underpinned by a conceptual framework based on a literature review. It was **specifically designed to assess children** as its target group, comprising a total of **31 questions, that cover both digital skills and digital knowledge**. This indicator has undergone **validation**, including cross-national validation, and serves as the basis for the surveys and performance tests that have been carried out in the context of the ySKILLS project (see Helsper et al., 2020). It is thus uniquely suited to large-scale population research and holds the potential to be deployed in the future to monitor the **different dimensions of digital skills** ([1] **technical and operational skills**; [2] **information navigation and processing skills**; [3] **communication and interaction skills**; and [4] **content creation and production skills**) of children and young people across the European Union. The current three-wave ySKILLS results could serve as a baseline for such **longitudinal research**.

Figure 2

The different dimensions of youth's digital skills
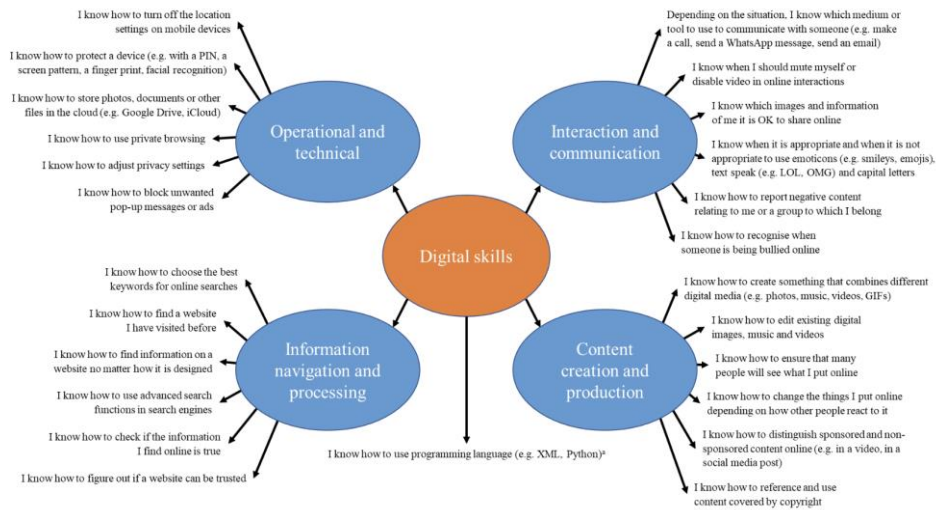
4.2 Policies

Recommendations 1, 2, 3, 5, and 6, as outlined in the set of recommendations towards EU policymakers taken from D 7.3, all refer to the development and the characteristics of EU **policies** regarding digital skills for children and young people.

Drawing on the findings of the ySKILLS project, D 7.3 steers the focus of policy makers towards the **key characteristics** of a European Union strategy that enable children to develop their digital skills and safely navigate the digital environment.

- **A cohesive, coherent, coordinated, and balanced EU policy approach**

First and foremost, this subset of policy recommendations highlights the necessity for a **cohesive, coherent, and coordinated EU policy approach** regarding children's digital skills, which caters to their **wellbeing** – including cognitive, psychological, physical and social aspects thereof – in the digital environment through the adoption of a **balanced approach** that ensures both protection from risks and harm and their participation in the digital environment.

The **attention to digital skills at the EU policy level is clear and has increased** over the past five years. Although there is not one single policy *exclusively* dedicated to children's digital skills, references to (the enhancement of) digital skills of children can be found in several flagship policy instruments that have recently been adopted. Such examples include the EU Strategy on the rights of the child (2021), the Declaration on European Digital Rights and Principles for the Digital Decade (2022), and the Better Internet for Kids+ Strategy (2022). Additional documents, such as the very recently adopted Proposal for a Council Recommendation on the key enabling factors for successful digital education and training (2023), more specifically focus on digital education.

The **EU Strategy on the rights of the child** was adopted by the European Commission in March 2021 with an aim to better protect all children, to help them fulfil their rights and to place them right at the core of EU policy making. More specifically, as the first comprehensive strategy on the rights of the child, it intends "to bring together all new and existing EU legislative, policy and funding instruments within one **comprehensive framework**" (Introduction). More specifically, the Strategy singles out five thematic areas, including Thematic Area 2 on socio-economic inclusion, health and education, Thematic area 3 on combating violence against children and ensuring child protection, and **Thematic area 5 on the digital and information society**. Under the latter thematic area, the focus is on an EU "where **children can safely navigate the digital environment and harness its opportunities**". Further, the **EU Strategy on the rights of the child** refers to the Digital Education Action Plan (2021-2027) which promotes **digital literacy** in view of tackling disinformation as well as to the **Erasmus+ programme** which will fund initiatives to support the **acquisition of digital skills** by all children. As one of the action points, the European Commission invites the Member States to ensure effective equal access to digital tools and high-speed Internet connection, **digital literacy**, accessible online educational material and education tools for all children and to support the development of **children's basic digital competences**, through the Digital Competence Framework for citizens, and to support **media literacy** actions as part of education, to develop children's ability to **critically evaluate online content**, and **detect disinformation and abusive material**.

Second, the (**non-binding) Declaration on European Digital Rights and Principles for the Digital Decade** was signed by the Presidents of the Commission, the European Parliament, and the Council in January 2022, and "reflects the shared political commitment of the EU and its Member States to promote and implement the rights and principles in all areas of digital life". The Declaration puts forward a **balanced approach** through a section dedicated to the need for protection and the empowerment of children and young people in the digital environment (Chapter V) and includes an explicit reference to the advancement of [digital] skills in relation to children and young people specifically. Chapter V (para 21) acknowledges the importance of improving children and young people's **wellbeing** and experiences in the digital environment. But most importantly, according to the Declaration, the **EU "commits to providing opportunities to all children and young people to acquire the necessary skills and competences, including media literacy and critical thinking, in order to navigate and engage in the digital environment actively, safely and to make informed choices**". Although the Declaration is a non-binding instrument, its straightforward commitment to the advancement of children and young people's digital skills as a crucial tool for active and safe participation in the digital environment is a strong signal that reflects the importance that the EU attaches to this issue.

Third, the **Better Internet for Kids + Strategy (BIK+)** which was adopted by the European Commission (DG CNECT) in May 2022, in line with its commitment in the Strategy on the rights of the child (see above), also includes an **explicit reference to (the importance of) children and young people's digital skills**. In the BIK+ Strategy, the European Commission highlighted the necessity to both realise the benefits of digital technology and **the necessity for equal access to** technology (devices and network), **digital skills and competences including media literacy for all children** (p. 1). The Commission emphasises that digital skills and competences, including digital literacy and an understanding of the use made of personal data, are fundamental for today's children, allowing them to learn, connect and be active while being informed participants in shaping the world around them. The BIK+ Strategy is built around the following **three pillars**, with the second pillar being strongly linked to the objectives of the ySKILLS project:

1. safe digital experiences to protect children from harmful and illegal online content, conduct, contact and consumer risks and to improve their **wellbeing online** through a safe, age-appropriate digital environment, created in a way that respects children's best interests;

2. **digital empowerment so children acquire the necessary skills and competences to make sound choices and express themselves in the online environment safely and responsibly;**
3. 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.

The BIK+ Strategy points towards a range of initiatives both at the level of the EU and at the level of the individual Member States, and further invites industry to support the said regulatory initiatives. At the same time special attention is paid to **the impact of the digital transformation on children's wellbeing (Pillars 1 and 2)**. Commitments that are put forward include the Commission's (a) support of the monitoring of the impact of the digital transformation on children's wellbeing by Member States, industry and academics via the BIK portal, from 2023; and (b) the development of awareness raising tools and activities on the risks children face as young consumers, with the support of the BIK portal and the Safer Internet Centres, from 2022.

One of the most recent initiatives aimed at addressing the lack of a whole-of-government approach to digital education and training, as well as the challenges in equipping people with the necessary digital skills, involves the adoption by the European Commission in April 2023 of two **proposals for Council Recommendations** aiming to "support Member States and the education and training sector in providing high-quality, inclusive and accessible digital education and training to develop the digital skills of European citizens". Although the **Proposals for a Council Recommendation on the key enabling factors for successful digital education and training**, and a **Council Recommendation on improving the provision of digital skills in education and training** both lack specific references to children, they contain useful recommendations that might impact the enhancement of children's digital skills. With the former calling for a coherent strategy specifically addressing digital education and skills and the latter focusing on the steps needed to promote digital competence development from early on and at all stages of education and training, they demonstrate the EU's focus on and investment in digital skills for individuals of all ages, including children and young people. Moreover, the two very recently adopted initiatives deliver on the two strategic priorities of the Digital Education Action Plan (see below) – i.e. fostering the development of a high-performing digital education ecosystem and enhancing digital skills and competences for the digital transformation – and appear to echo the ySKILLS' call for a stronger EU policy focus on (children and young people's) digital skills.

Other important policy instruments refer to the importance of digital skills, but predominantly in relation to employment and the workforce. In March 2021, as part of the **European Digital Agenda**, for instance, the EU Commission (DG CNECT) issued the **"2030 Digital Compass: the European way for the Digital Decade"**. The ten-year Digital Compass was meant to put the EU's digital ambitions for 2030 into concrete terms and includes the aspiration for a **digitally skilled population** (with a reference to **lifelong learning**). The Digital Compass focuses on the means to foster a four-point vision (skills, government, infrastructure, business) for Europe's digital transformation. According to the European Commission,

> **digital skills** will be essential to reinforce our collective resilience as a society. Basic digital skills for all citizens and the opportunity to acquire new specialised digital skills for the workforce are a prerequisite to participate actively in the Digital Decade, as explained in the European Skills Agenda (para 3.1).

Further, broad-based **digital skills** should also build a society which can trust digital products and online services, identify disinformation and fraud attempts, protect itself against cyberattacks, scams and fraud online, and in which **children learn how to understand and navigate through the myriad of information they are exposed to online** (para 3.1).

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The **Digital Compass** outlines four digital targets to be achieved by **2030**, one of which pertains to **digital skills**. More precisely, the target is for **at least 80% of all adults to possess basic digital skills,** and for there to be 20 million ICT specialists employed in the EU, with a particular focus on increasing the participation of women in such jobs.[6] Although children are referenced in the document (see quote above), the document is focused on citizens in general, and adults in particular. In fact, while the 2030 Digital Compass aims for the empowerment of the entire population through the development of basic digital skills, specific emphasis is put on the acquisition of (specialised) digital skills tailored for the workforce.

- ▪ **A policy approach for the development of digital skills to ensure equal access and opportunities to all children which pays attention to their diversity (in terms of gender, age and cognitive abilities), vulnerabilities and the factors that cause them**

Second, the ySKILLS findings call for an approach for the development of digital skills which shall **ensure equal access and opportunities in the digital environment for all children** and pay due **attention to their diversity (in terms of gender, age and cognitive abilities), their vulnerabilities and the underlying factors** contributing to those vulnerabilities. Policymakers are prompted to consider elements which can impact the level of children and young people's digital skills and wellbeing online, such as **low socioeconomic status, poor or fair self-reported health, poor academic performance, perceived discrimination, low self-efficacy, low family and peer support, and restrictive parental mediation**.

Specific attention within the ySKILLS project is paid to **children with mental health difficulties and refugee teenagers**. Focusing on the former group, as extensively discussed in D 6.1 (*Young people experiencing internet-related mental health difficulties: the benefits and risks of digital skills*; Livingstone et al., 2022), they describe themselves as investing considerable effort in critically analysing the affordances of digital products and services to develop their own specialised digital skills to pursue their interests, mitigate risks, and seek support and help. In turn, the findings call for additional regulatory steps that shall support children facing mental health difficulties in their participation in the digital environment and that shall meet their **diverse and complex needs** (p. 9).

An overview of the policy framework that is relevant to the enhancement of children's digital skills and wellbeing in the digital environment reveals scattered references to the enhancement of digital skills of vulnerable children. While the focus on vulnerabilities and the factors that cause them in the context of the digital environment and in relation to children in particular could be considered limited, the **BIK+ Strategy** does include a **straightforward acknowledgment that "children in vulnerable situations, such as children with disabilities, children from a minority racial or ethnic background, refugee children, children in care, LGBTQI+ children, as well as children with a disadvantaged socio-economic background may face additional challenges in the digital environment"** (p. 1). Moreover, within the BIK+ Strategy, it is recognised that children at risk of poverty and social exclusion, children with a migrant or Roma background and other children particularly exposed to discrimination and segregation, children whose parents do not have basic digital skills, children with disabilities, children in care settings, **all have specific needs**. At the same time, it is emphasised that "**children in vulnerable situations, children at risk of poverty and social exclusion and children living in rural and remote areas with inadequate broadband infrastructure should enjoy equal access to both digital devices and skills, and equal chances to harness the opportunities of the digital decade**" (p. 8). The European Commission also highlights the need for initiatives that focus on gender balance, in relation to the acquisition of digital skills from

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[6] According to the first Report on the State of the Digital Decade, published in September 2023, 68% of the population have acquired basic digital skills thus far.

an early age, and assisting the development of vulnerable groups' digital skills, through the support of national and EU level programmes by Safer Internet Centres.

More often, however, **references to vulnerabilities are either linked to children, yet not specifically in relation to the digital environment, or linked to the digital environment, yet not specifically in relation to children**. The need for a comprehensive strategy that is inclusive of all children and that supports them in vulnerable situations was voiced by children during the 13th European Forum on the Rights of the Child (2020). This perspective was acknowledged by the drafters of the EU Strategy on the rights of the child. While its focus remains the overarching consideration of specific needs of certain groups of children, including those in situations of multiple vulnerabilities, and irrespective of a connection to the digital environment, the **EU Strategy on the rights of the child** does acknowledge specific vulnerabilities of children in relation to the digital environment. More specifically, the Strategy refers to the finding on how "the shift to distance learning disproportionately affected very young children, **those with special needs, those living in poverty, in marginalised communities, such as Roma children, and in remote and rural areas, lacking access to internet connections and IT equipment**" (p. 2).

The **Declaration on European Digital Rights and Principles for the Digital Decade** addresses diversity and vulnerabilities, although not specifically in relation to children and young people. In Chapter II, which focuses on Solidarity and Inclusion, the EU commits to "a digital transformation that leaves nobody behind [and that] should benefit everyone, achieve gender balance, and include notably elderly people, people living in rural areas, persons with disabilities, or marginalised, vulnerable or disenfranchised people and those who act on their behalf [and that] should also promote cultural and linguistic diversity".

In the field of education and youth, the European Commission adopted the **new EU Youth Strategy (2019-2027)** following the Council Resolution of 26 November 2018. This strategy is designed to assist youth participation in democratic life and also supports social and civic engagement, ensuring that **all young people** have the necessary resources to actively take part in society. The EU Youth Strategy contributes to the realisation of the **11 European Youth Goals**, which were developed through a 2017-2018 dialogue process involving young people from across Europe. The European Youth Goals address various cross-sectoral areas that impact youth and further identify related challenges they may face. While the European Youth Goals include objectives related to gender equality, inclusive societies, and the promotion of mental health and wellbeing, **there is no direct link to the digital environment and digital skills** within these goals. Similarly, the **Council Recommendation** of 22 May 2019 **on High-Quality Early Childhood Education and Care Systems** underscores the importance of early childhood education and care to support children's development and reduce socio-economic and territorial inequalities. It also aims to support parents, especially women, in (re)integrating in the labour market. However, it does not specifically address digital issues. Along the same lines, the European Education Area (EEA) aims to improve the quality of education and training **for all**, promoting **inclusion and gender equality**.

Finally, certain EU policy initiatives focus on specific vulnerabilities in relation to the digital environment. In its **Action plan on Integration and Inclusion 2021-2027,** adopted in November 2020, the European Commission acknowledges that **migrants and EU citizens with a migrant background often face obstacles in accessing digital courses and services** because of lack of infrastructure, language barriers, lack of electronic identification means and digital trust services (such as electronic signature) or **lack of the digital skills to use these services** (Chapter IV)**.** Furthermore, the Action Plan highlights that **migrant children with disabilities need additional support to participate in education on equal basis with others.** Explicit reference to migrant children or children with a migrant background and the role of schools in their integration process is included, however not in relation to the digital environment and the advancement of their digital skills.

- **A policy approach that enhances dimensions of digital skills that are found to be less well developed amongst youth**

Furthermore, ySKILLS policy recommendations highlight the necessity for policymakers to focus on the **enhancement of dimensions of digital skills that are found to be less well developed amongst youth**. Such an approach presupposes (a) the distinction between different dimensions of digital skills within policy frameworks and (b) evidence on the level of youth's digital skills and the measurement of the level and strength of the different dimensions of youth's digital skills via measuring tools such as the ySKILLS-developed youth Digital Skills Indicator (yDSI).

Figure 3

ySKILLS theoretical model of Digital Literacy
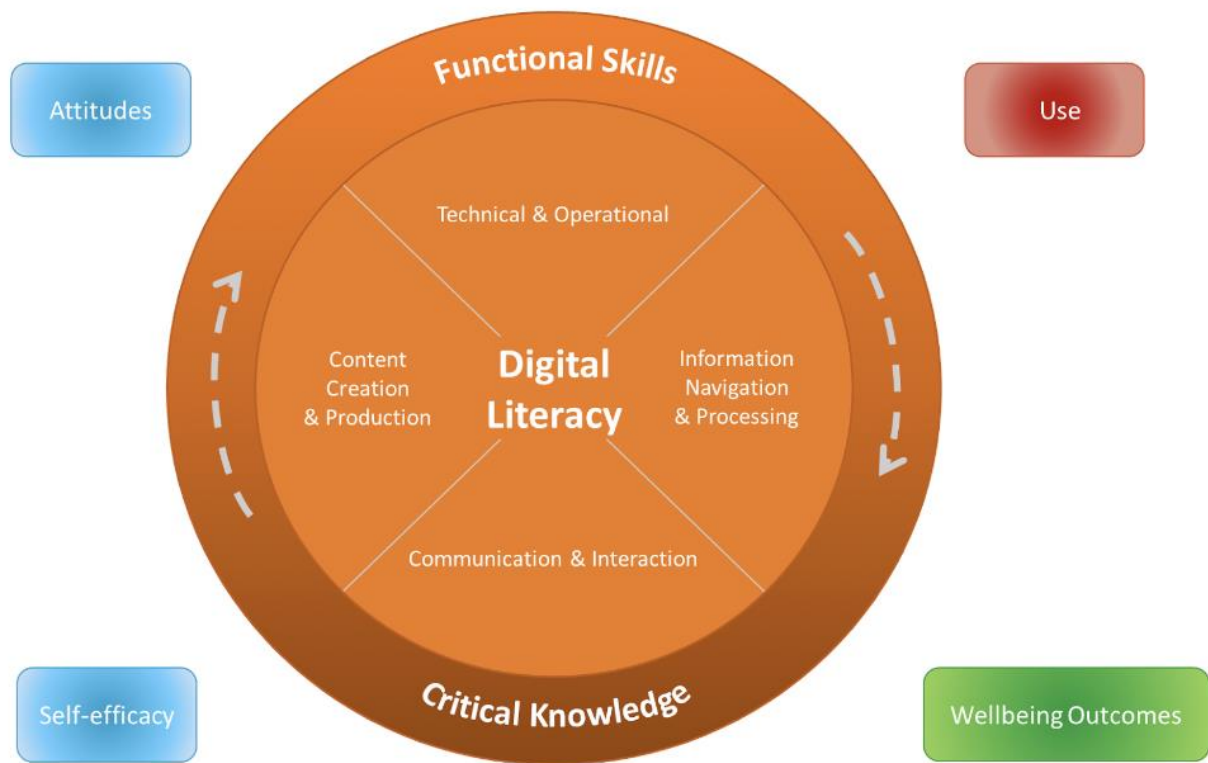
Source: Helsper, E.J., Schneider, L.S., van Deursen, A.J.A.M., & van Laar, E. (2020). *The youth Digital Skills Indicator: Report on the conceptualisation and development of the ySKILLS digital skills measure*. KU Leuven: ySKILLS (Deliverable 3.3); Šmahel, D., Mascheroni G., Livingstone, S., Helsper, E., van Deursen, A.J. A.M., Tercova, N., Stoilova, M., Georgiou, M. A., Machackova, H., Alho, K. (2023). *Theoretical Integration of ySKILLS: Towards a New Model of Digital Literacy*. KU Leuven: ySKILLS (Deliverable 2.3)

The youth Digital Skills Indicator (yDSI) – developed and used within the ySKILLS project – identifies **four dimensions of digital skills**: (1) technical and operational skills; (2) information

navigation and processing skills; (3) communication and interaction skills; and (4) content creation and production skills. Furthermore, as explained in detail in D 3.3 (*The youth Digital Skills Indicator: Report on the conceptualisation and development of the ySKILLS digital skills measure*; Helsper et al., 2020), across all four dimensions, the yDSI distinguishes between two key aspects: being able to use the functionalities of information and communication technologies (ICTs) (**functional aspects**), and understanding why ICTs are designed and content is produced in certain ways and being able to use that knowledge in managing interactions in and with digital spaces (**critical aspects**). The evidence from the ySKILLS three-wave longitudinal survey showed a need for a more nuanced multidimensional approach to the construct of digital skills, given their diverse trajectories of development, the various factors affecting their change, and the diversified impact of different dimensions of skills on digital engagement, experiences with online risks, and youth's wellbeing (Machackova et al., 2023, p. 5).

Children and young people participating in the ySKILLS project self-reported **lower levels of information navigation and processing skills** (Vissenberg et al., 2022, p. 26). The evidence from ySKILLS suggests that many children struggle to differentiate between reliable and unreliable sources of information (Livingstone and Stoilova, 2023, p. 36). At the same time, higher engagement online positively impacted the information navigation and processing skills as well as communication and interaction skills (Machackova et al., 2023, p. 33). Hence, the enhancement of this particular dimension of children's digital skills (i.e. information navigation and processing skills) appears to be of significant importance for children's wellbeing in the digital environment. In contrast, a significant portion of the participants reported having high levels of technical and operational skills, as well as strong communication and interaction skills (Vissenberg et al., 2022, p. 26).

ySKILLS also examined the effects of different dimensions on specific types of risks and found the link between the two to be considerably diverse. Overall, though, the ySKILLS findings supported previous suggestions about the role of digital skills in relation to children's exposure to risk (of harm): digital skills are positively linked with a higher chance of encountering risk but are also associated with lower harm (Machackova et al., 2023, p. 52). However, it is important to interpret these findings cautiously, as they are based on simple comparisons, analysed on smaller samples, and often show rather low effect sizes (Machackova et al., 2023, p. 52).

Policy instruments and initiatives at the EU level, however, **rarely distinguish between different dimensions or types of digital skills** – especially those specific to children – **in a consistent way**. Most commonly, digital skills are discussed in further detail in relation to **media literacy**, and at times **special attention** is paid to (children's) **critical thinking skills** online, often within the context of addressing **disinformation**.

In the context of the **second BIK+ Strategy pillar**, it is emphasised that media literacy skills are "crucial for children to understand and navigate the information they access online, to identify online risks such as mis/disinformation, scams and fraud, and hidden advertising, and to participate actively and responsibly in the digital economy, society, and in democratic processes". Similarly, acknowledging that "too many children still face severe and regular violations of their rights" which are even exacerbated after the COVID-19 pandemic, in the **EU Strategy on the rights of the child**, the Commission invites Member States to "support **media literacy** actions as part of education, to **develop children's ability to critically evaluate online content, and detect disinformation and abusive material**" (p. 17). Within the new EU Youth Strategy, one of the **11 European Youth Goals**, which were developed through a 2017-2018 dialogue process that involved young people from across Europe, identified the need for an **information and constructive dialogue** among European Youth, with a target to ensure young people have better access to reliable information, support their **ability to evaluate information critically** and engage in participatory and constructive dialogue. As laid down in the Goal description,

following the acknowledgment that young people need to be adequately equipped to navigate the media landscape, the EU strives to ensure that young people **have the ability to recognise and report repeatedly misleading news and verify the accuracy of news sources used; that they can engage in respectful, tolerant and non-violent dialogue,** *online* **and offline** [authors' emphasis]**;** and that parents and carers, and all those involved with educating and training young people are equipped with media and digital literacy skills and that they are reliable information sources for young people.

Similarly, in its **Communication "Tackling online disinformation: a European Approach,"** the European Commission highlights that "life-long development of critical and digital competences, in particular for young people, is crucial to reinforce the resilience of our societies to disinformation" (p. 12), and calls for the "support of Internet safety, digital wellbeing and, digital skills that aim at fostering a critical awareness of citizens – in particular, young people – of the digital environment, which in turn helps strengthen digital media literacy" (p. 13). Furthermore, the Commission "encourages Member States to mobilise resources and include in their educational policies digital citizenship, media literacy, the development of **critical-thinking** skills for the online environment, and awareness-raising activities on disinformation and online amplification techniques" (p. 13).

The focus on the enhancement of critical thinking skills within the existing EU policy framework is **not always associated with children in particular**. For instance, the **Council conclusions on media literacy in an ever-changing world** focus on "citizens of all ages" rather than children in particular. Yet, its call for empowering citizens with media literacy and critical thinking skills to exercise judgment, analyse complex realities and recognise the difference between opinion and fact could also be considered to apply to children. The same is true for the **European democracy action plan**. There, the Commission explains how

> media literacy, including critical thinking, is an effective capacity helping citizens of all ages to navigate the news environment, identify different types of media and how they work, have a critical understanding of social networks and make informed decisions; media literacy skills help citizens check information before sharing it, understand who is behind it, why it was distributed to them and whether it is credible; and digital literacy enables people to participate in the online environment wisely, safely and ethically (p. 24).

Some policy documents refer to children's or individuals' critical thinking skills and media literacy, yet **not in relation to the digital environment**. In the **Action plan on Integration and Inclusion 2021-2027**, for instance, while there is a reference to the importance of digital literacy for migrants' integration, the development of critical thinking skills is discussed within school curricula and schools' role in building resilience in a broader sense rather than specifically addressing the development of digital critical thinking skills.

The **EU Strategy on victims' rights (2020-2025)**, introduced in June 2020, highlights the importance of digital skills in the context of cybercrime rates, particularly in light of the pandemic's impact. More specifically, the EU Commission Communication makes a particular **reference to children and the possibility that they lack the necessary digital skills or awareness of available remedies** (p. 5). In particular, children's digital skills are considered important as they facilitate access to remedies and the reporting of offences. Although the Communication does not provide a detailed description of the specific skills that merit specific attention, it underscores the importance of **facilitating the process of reporting cybercrimes and ensuring that victims, including children, receive the necessary assistance and support they need in such situations**.

In sum, within the current EU policy framework, there appears to be a lack of explicit attention to the full range of dimensions of digital skills. The framework mainly focuses on the importance of **critical**

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thinking skills in the digital environment and in relation to media literacy and the necessity to deal with online disinformation. While these critical thinking skills are crucial, the broader range of digital skills may not receive the same level of explicit attention within existing policies and initiatives. The importance of critical thinking skills is advocated for on the basis of both citizens' – and thus also children's – empowerment and resilience and the need for protection from online risks. The promotion of critical thinking skills and tools to handle disinformation is most often justified by recognising that individuals, including children, are exposed to large amounts of disinformation; that having a critical understanding of and responsible interaction with media is key for ensuring the resilience of democratic societies and the enhancement of democratic participation; or that children face a plethora of online risks that can be mitigated through the acquisition of such skills. Whereas the importance of critical thinking skills is not to be undervalued in times of rampant disinformation in the digital environment, **the ySKILLS recommendations encourage policymakers to value and measure the full range of dimensions of digitals skills**.

- ▪ **A policy approach with a specific focus on educational policies and practices for digital literacy and increased digital skills, including quality training opportunities for teachers and other professionals working with children**

Finally, according to the ySKILLS evidence, children need appropriate and meaningful external support, individual effort, and motivation to become digitally skilled (Cino et al., 2022, p. 6). Hence, the findings point (a) to the importance of **education policies and practices for digital literacy and increased digital skills** and (b) beyond children's education, to the **inclusion of training opportunities for teachers and other professionals working with children,** that shall assist children in a safer participation in the digital environment.

Notwithstanding the call for an EU policy approach that builds on these two elements, it is important to consider that **education** is an area where the EU only has **supporting competence**, meaning that the primary responsibility and power to create school curricula or, broader, educational/training programmes and initiatives for the population lie with the Member States. While the EU cannot put forward legislation that harmonises Member States' laws or regulations in this area, nor directly formulate curricula and training programmes, it does have the capacity to develop policy instruments and initiatives that offer guidance to national authorities and regulators and promote an aligned approach towards children's digital skills and wellbeing in the digital environment among Member States.

In 2020, the Council of the European Union issued **Conclusions on digital education in Europe's knowledge societies**. Within these Conclusions, the Council urged the European Commission to take several actions related to digital education: "**ensure a coordinated approach on digital education** within the Commission and launch, together with Member States and relevant stakeholders, a strategic reflection process on [..] **teacher and student digital skills**, [..] while aiming at a high-quality and **inclusive education** and **training**" (Conclusion no. 38). In addition, it invites the Commission and the Member States to "**further support through Erasmus+ projects the professional development of teachers as well as the development of digital skills, competences and capacity**, the effective implementation of digital education and training methods and tools [..]" (Conclusion no. 44).

The **Digital Education Action Plan (2021-2027): Resetting education and training for the digital age,** adopted by the European Commission (DG EAC) in September 2020, sets out a common vision of high-quality, inclusive and accessible digital education in Europe, and aims to support the adaptation of the education and training systems of Member States to the digital age. In the outset of the Action Plan, it is underlined that the need to **develop digital skills for all** has been a priority within the current Presidency, as "raising the quality and inclusiveness of education and training

systems and the provision of digital skills for all during the digital and green transitions" is considered key (p. 1). The Digital Education Action Plan highlights the **risks disinformation poses for educators and students and the urgent need to develop digital skills and competences of all learners**, in both formal and non-formal education. The Digital Education Action Plan announced the creation of the **European Digital Education Hub** to promote cooperation and information exchange on digital education.

The European Commission and the EU Member States are jointly working towards a common wide-ranging improvement of the EU's education and training sector, called the **European Education Area (EEA)**, by 2025. Among the goals of the EEA is the improvement of the quality of education and training for all; inclusion and gender equality; and the promotion of lifelong learning. The European Commission, as part of its European Education Area strategic framework, has established specific targets. One of these targets is to ensure that **less than 15% of eighth-graders fall into the category of low-achievers in computer and information literacy by 2030**. To help achieve these targets and increase the commitment to digital education and skills, a **Structured Dialogue with Member States on digital education and skills** was initiated in October 2021. This dialogue was launched in response to a call by President Ursula von der Leyen in her 2021 State of the Union address. Its primary objective is to increase the political visibility of digital education and skills and secure commitments from Member States to meet the set targets for 2030.

In the EU Strategy on the rights of the child, the European Commission promises financial assistance to support access to affordable and sustainable connectivity for schools, as well as **to include digital skills in school curricula and teacher training** (p. 19). It further highlights that the affordance of continued access to safe, quality and inclusive education, is essential to equipping children and young people with essential skills, including during crisis and conflicts.

Similarly, a reference to education and lifelong training on digital skills appears in two other flagship policy instruments, namely the Declaration on European digital rights and principles for the Digital Decade and the BIK+ Strategy. In addition to explicit reference to children and digital skills, the **Declaration** also highlights that "everyone has the right to education, training and lifelong learning and should be able to acquire all basic and advanced digital skills", and hence includes a "commitment to promoting high-quality digital education and training, including with a view to bridging the digital gender divide" and to [..] "support[..] efforts that allow learners and teachers to acquire and share all necessary digital skills and competences to take an active part in the economy, society, and in democratic processes" (Chapter II).

In the context of the BIK+ Strategy, according to the Commission, a common message heard in preparatory consultations with children was the need for **improved media literacy and online safety education for children in schools**. Within the BIK+ Strategy, the Commission commits to: **develop and distribute teaching modules (MOOCs) for teachers** via the BIK portal and Safe Internet Centres (SICs); **promote the exchange of good practices for national curricula on media literacy** between Member States and amongst schools and educators across the EU, under the Structured Dialogue on digital education and skills and through relevant expert groups; **organise media literacy campaigns targeting children, teachers, parents and carers,** via multipliers; and **strengthen the support of the SICs in Member States to provide children in vulnerable situations with non-formal education and training**, to address the digital divide.

Next, the two proposals for Council recommendations **on the key enabling factors for successful digital education and training** and **on improving the provision of digital skills in education and training**, are both in line with the objectives set in the Digital Education Action Plan, the Digital Decade Policy Programme, the European Declaration on Digital Rights and Principles for the Digital Decade and the BIK+ Strategy and complement one another. The former proposal builds on the key

enabling factors for successful digital education identified in the Digital Education Action Plan 2021-2027, the Council Conclusions on digital education in Europe's knowledge societies and the findings of the structured dialogue on the first strategic priority (promoting a high-performing digital education ecosystem) of the Digital Education Action Plan and **includes recommendations to Member States on how to achieve accessible, high-quality and inclusive digital education for all**. First and foremost, the proposal highlights that the introduction of digital technologies in education and training systems **requires a whole-of-government approach that ensures collaboration and coordination of different departments of government**. The latter proposal **aims to support Member States in addressing challenges related to digital skills development** and the ability of education and training systems to support their provision. The proposal acknowledges the importance of digital skills for all and takes into consideration all levels of education and training and calls for engagement by various stakeholders. Its implementation will support the attainment of the EU-level targets on digital skills, including by addressing the social and territorial dimension of existing skill gaps.

Finally, within the supporting competence of the EU in the area of **youth**, and following the Council Resolution of 26 November 2018, the European Commission adopted the **new EU Youth Strategy (2019-2027)**, which aims to assist youth participation in democratic life and also supports social and civic engagement, ensuring that all young people have the necessary resources to take part in society. Among the **11 European Youth Goals**, which were developed during a 2017-2018 dialogue process as part of the EU youth strategy, attention is paid both to equipping young people and parents and carers, and all those involved with educating and training young people, with media and digital literacy skills.

4.3 Regulation

Recommendations 9 and 11, as listed in the set of recommendations towards EU policymakers that was extracted from D 7.3, both refer to **implementing regulation to enhance the positive outcomes of digital media use for children's wellbeing**, including the protection of their rights to communication, data protection and privacy and protection from commercial exploitation.

In recent years, many different legislative instruments have been adopted by the EU legislator that affect children's experiences in the digital environment. Certain instruments impose specific obligations on organisations and companies who process (children's) personal data, offer audiovisual or platform services to (child) users or deploy AI-based systems that might impact individuals in general or children in particular (Verdoodt et al., 2023).

General Data Protection Regulation

The **General Data Protection Regulation** (GDPR), for instance, which became applicable in 2018, stipulates that personal data of children merits specific protection (Recital 38). There are both child-specific and general obligations for data controllers in the GDPR that might provide particular protection for children's data, including those related to consent and legitimate interests (Articles 6 and 8), child-friendly information on data processing (Article 12), the implementation of data protection by design and default (Article 25) and conducting data protection impact assessments (DPIAs) where processing activities are likely to result in a high risk to the rights and freedoms of individuals (Article 35) (Lievens & Verdoodt, 2018).

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The GDPR recognises children both as vulnerable subjects from a data protection point of view, and as rights holders who can exercise certain data protection rights, consent to the processing of their data (from a certain age onwards), or submit a complaint to the Data Protection Authority. Although there is no explicit mention of skills in the text, it could be argued that the exercise of **data subject rights**[7] or **remedies** (such as complaining to a Data Protection Authority or going to court; see Articles 77-82 GDPR) does require knowledge about these rights and remedies as well as certain skills. Furthermore, an important principle in the GDPR is the "data protection by design and by default" principle (Article 25) (see EDPB, 2020). In implementing this principle, **"privacy" settings** might play a crucial role. Default settings can be used to make sure that children's personal data is afforded the specific protection it merits, and such settings can also be used to empower children to control the processing of certain types of personal data. At the same time, adjusting such settings does require a certain level of digital skills, which may vary according to age and other factors.

Audiovisual Media Services Directive

The **Audiovisual Media Services Directive** (AVMSD) requires Member States to introduce specific obligations for (amongst others) video-sharing platform providers (such as YouTube) at the national level to take appropriate measures to protect minors against the distribution of (1) programmes, (2) user-generated videos, and (3) audiovisual commercial communications which may impair children's physical, mental or moral development.

The Directive also emphasises the importance and promotion of the development of **media literacy**, defined as a notion referring to "skills, knowledge and understanding that allow consumers to use media effectively and safely". The AVMSD further underlines that media literacy should "not be limited to learning about tools and technologies but should aim to equip citizens with the **critical thinking skills** required to exercise judgment, analyse complex realities and recognise the difference between opinion and fact" (Directive (EU) 2018/1808, Recital 59). Such critical skills are an important dimension of the digital skills as they are envisaged in the ySKILLS project. References to media literacy can be found in Article 28b (3) regarding the measures that video-sharing platforms should take ("providing for effective media literacy measures and tools and raising users' awareness of those measures and tools") and Article 33a (1) which specifically requires Member States to "promote and take measures for the development of media literacy skills". According to the latter, Member States also need to report every three years on the measures that have been taken (Article 33a (2)). In February 2023, the Commission published **guidelines** to support the Member States when reporting on the relevant actions, as envisaged in Article 33a (3) of the AVMSD and to encourage Member States to continue to exchange information and best practices on media literacy in the context of the European Regulators Group for Audiovisual Media Services (ERGA).

In relation to the **scope** and **structure** of the reports, the Commission encourages Member States to discuss (a) legal and policy measures, (b) organisational measures (e.g. which authorities or bodies are responsible for promoting media literacy skills), (c) public funding and other media literacy arrangements (e.g. extent of public financial resources allocated to promoting media literacy skills), (d) engagement and awareness-raising activities, including media literacy curricula (e.g. measures adopted to promote and develop media literacy skills in formal educational curricula at different levels – including primary and secondary education and training levels; dedicated media literacy modules for parties who work with children, such as teachers and trainers), and (e) evaluation measures and methods (e.g. measures that have been adopted to assess the impact of initiatives promoting media literacy, including performance measurement indicators). The guidelines focus

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[7] Data subject rights include the right to information, the right of access, the right to rectification, the right to erasure, the right to restrict processing, the right to data portability, the right to object and the right not to be subject to a decision based solely on automated processing (Chapter III GDPR).

predominantly on media literacy (skills), but acknowledge that the reports will also be useful in view of the targets on **digital skills** in the context of the Digital Decade Policy Programme 2030. In that regard, ySKILLS concepts and results could prove useful to ensure harmonisation of reporting across Member States, for instance, regarding attention for the different dimensions of digital skills. Whereas the Media Literacy Guidelines of the Commission pay specific attention to critical thinking skills, Member States could be encouraged to report on measures that relate to the other dimensions as well.

Digital Services Act

The **Digital Services Act** (DSA), adopted in 2022, **lays down harmonised rules** on the provision of intermediary services in the internal market (Article 1), with particular respect to a **conditional exemption from liability of providers** of intermediary services, rules on specific **due diligence obligations** tailored to certain specific categories of providers of intermediary services and rules on the **implementation and enforcement** of the DSA itself, including as regards the cooperation of and coordination between the competent authorities.

The DSA is relevant to ySKILLS mainly in that it requires online platforms to put in place **reporting mechanisms** to enable users (including children) to report illegal content, it obliges online platforms to adopt measures to ensure a **high level of privacy, safety, and security of children**, and it compels very large online platforms (VLOPs) to assess **systemic risks** (e.g., disinformation, illegal content such child sexual abuse material) on their platforms to which children may be exposed (and regarding which digital skills may play a role in mitigation).

Article 16 requires online platforms to put mechanisms in place that enable individuals to notify specific items of information that the individual considers to be illegal content, so-called **"reporting" or "notice and action"** mechanisms. To submit such notices, quite detailed information is required. Whereas such mechanisms may provide children with an important avenue to report illegal content, they also require a certain level of digital skills.

Article 28 (1) requires providers of online platforms accessible to minors to implement appropriate and proportionate measures to ensure a **high level of privacy, safety, and security** of minors, on their service. Article 28 (2) contains a prohibition on targeting advertisements based on profiling "when they are aware with reasonable certainty that the recipient of the service is a minor".

Moreover, under the DSA, Very Large Online Platforms (VLOPs) such as Meta, TikTok and Snapchat, need to comply with risk assessment and mitigation obligations. Article 34 requires VLOPs and VLOSEs to undertake an assessment of the systemic risks in the EU "stemming from the design or functioning of their service and its related systems, including algorithmic systems, or from the use made of their services". Four categories of risks are listed, of which three might be particularly relevant for children: "(a) the dissemination of illegal content; (b) any actual or foreseeable negative effects for the exercise of fundamental rights, [such as] the rights of the child [..] (d) any actual or foreseeable negative effects in relation to [..] the protection of [..] minors [..]". Once the systemic risks are identified, VLOPs need to establish reasonable, proportionate, and effective **mitigation measures**, tailored to the risks. Such measures may include adapting the design of their services, testing and adapting their algorithmic systems (including recommender systems) or taking targeted measures to protect the rights of the child, including age verification and parental control tools.

Finally, the DSA also puts in place obligations that are not child-specific but which may have a significant impact on children. Article 25, for instance, prohibits **dark patterns** in the design, organisation or operation of online interfaces of platforms. Such dark patterns are practices that can

be used by platforms to persuade users to engage in unwanted behaviours or make undesired decisions which have negative consequences for them (Recital 67). Examples are making the procedure of cancelling a service significantly more cumbersome than signing up to it or making certain choices more difficult or time-consuming than others (Recital 67). Children in particular might be vulnerable to such practices (see Lupiáñez-Villanueva et al., 2022). In addition, Article 27 puts in place transparency obligations for recommender systems, entailing that platforms must clearly explain the main parameters that they use, and how to modify or influence those parameters. VLOPs that use recommender systems also need to offer at least one option for each recommender system which is not based on profiling (Article 38); this could, for instance, be a chronological feed. Yet, such a feed should not necessarily be the default feed. This entails that **digital skills relating to the adjustment of the service's settings** are key. In particular, children should have the skills, first, to become aware of and look for the (existence of an) option that is not based on profiling, and second, to select it over other options that are based on profiling. In the case that the default recommender system is based on profiling, children should be able to switch it off and select an alternative one.

Interestingly, the Digital Services Act encourages the development of voluntary codes of conduct (Article 45). The European Commission announced in this regard in the BIK+ Strategy its intention to facilitate "a comprehensive EU code of conduct on age-appropriate design, building on the new rules in the DSA and in line with the AVMSD and GDPR". Such a code may provide an opportunity to provide guidance to platform providers and other companies on how to design mechanisms such as reporting tools or privacy setting in a way that takes into account children's digital skills, and on promoting the different dimensions of children's digital skills more in general.

By providing specific obligations for (very large) online platforms, the DSA constitutes an essential component of the EU framework aimed at making the digital environment better adapted to the needs and expectations of children. It could be argued that such a framework complements the role of digital skills, as **proficiency in digital skills is not sufficient to address certain risks for minors online, if platforms do not design their services in a way apt at mitigating them**.

Proposal for an AI Act

An instrument that is currently going through the legislative process is the **Proposal for an AI Act.** This Act (in its current form) would prohibit AI-based systems that exploit children's vulnerabilities, and impose a series of requirements on AI-based systems that are considered high-risk (e.g. in the area of education). For such high-risk systems, the proposal states that specific consideration shall be given to whether the high-risk AI system is likely to be accessed by or have an impact on children (Article 9 [8]). The Proposal predominantly focuses on obligations for providers and users of AI-based systems and does not (yet) attribute rights to individuals that are subjected to decisions or predictions that follow from such systems. However, this might still change throughout the legislative process.

Other legislative instruments

In addition to these sector-specific instruments, aimed at specific technologies or types of services, the consumer protection framework that is in place at the EU level offers child consumers who are considered to be particularly vulnerable protection against misleading, manipulative or aggressive commercial practices, also in the digital environment. Such practices are considered unfair under the **Unfair Commercial Practices Directive**. Other types of instruments require Member States to criminalise certain acts to protect children. This includes the **Directive on Child Sexual Exploitation and Abuse**, which criminalises the production and distribution of and access to Child Sexual Abuse Material (CSAM) and solicitation of children. In that regard, the **Declaration on European Digital**

Rights and Principles for the Digital Decade also states that specific attention should be paid to the right of children and young people to be protected from all crimes, committed via or facilitated through digital technologies. Whenever children become victims of offences in the digital environment, the **Victims' Rights Directive** is relevant. It establishes minimum standards on the rights, support and protection of victims of crime and ensures that persons who have fallen victim to crime are recognised and treated with respect. They must also receive proper protection, support and access to justice. When children become the **victim of cybercrime** or digital offences, the rights of this Directive are fully applicable. Potential links to digital skills exist regarding the extent to which children's digital skills could potentially be a source of protection against (or of vulnerability in terms of increased exposure to) repeat victimisation.

4.4 Communication & stakeholders

Recommendations 4 and 10, as listed in the set of recommendations towards EU policymakers from D 7.3, refer to the **communication of policies that are relevant to the promotion of children's digital skills and wellbeing in the digital environment, including the involvement of stakeholders that may cater to the overarching aim of ySKILLS.**

In order for policies to be meaningful, all intended stakeholder groups must be aware of them. When it comes to EU policies on digital skills, these target stakeholder groups, broadly interpreted, might range from national governments, policymakers and educational authorities, to industry, civil society, educators/teachers, parents and children. Communication of EU policies usually happens through the publication of communications, recommendations or other types of documents. Whereas this might reach national policy actors, other stakeholders might need to be addressed in different ways. Here, **bodies** that have been appointed or created at EU level and been assigned with a mandate or tasks and powers that might affect digital skills of children either directly or indirectly, might play a role. Such bodies include, amongst others, the European Regulators Group for Audio-Visual Media Services (ERGA), the Media Literacy Expert Group, the High-level Group on Digital Education and Skills; the Working Group on Digital Education, the Digital Skills and Jobs Coalition, and the European Digital Media Observatory (EDMO). Such bodies might engage in awareness-raising with regard to policies on digital skills that take into account the different dimensions of skills, the factors that affect children's digital skills and might cause vulnerabilities, and the sharing of best practices.

Table 3

Selection of bodies that could contribute to awareness-raising about EU policies regarding children's digital skills

European Regulators Group for Audio-Visual Media Services (ERGA)	An important task of ERGA is to exchange experience and best practices on the application of the regulatory framework for audiovisual media services, including on accessibility and **media literacy**.
Media Literacy Expert Group	The group's mission is to discover, bring to the light, document, and extend good practices in the field of **media literacy;** facilitate networking between different stakeholders, with the aim of

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	cross-fertilisation; and explore synergies between different EU policies and **media literacy** initiatives.
High-level Group on Digital Education and Skills (will be set up)	The Proposal for a Council Recommendation on the key enabling factors for successful digital education and training refers to the creation of a High-level Group on Digital Education and Skills, building on the Structured Dialogue with Member States.
Working Group on Digital Education	The Working Group on Digital Education aims to promote mutual learning on policy reform of national education systems with a view to effectively contributing to the achievement of the European Education Area by 2025, and the Digital Education Action Plan (2021-2027).
Digital Skills and Jobs Coalition	The Digital Skills and Jobs Coalition (DSJC) is an EU initiative that tackles the digital skills gap by bringing together Member States, companies, social partners, non-profit organisations and education providers, who work to address the lack of digital skills in Europe. It offers organisations that aim to increase **digital skills** across Europe "an opportunity to learn from peers and showcase their actions and impact" (Digital Skills and Jobs Platform, n.d.). Work carried out by the Coalition aims to contribute to reaching the Digital Decade targets.
European Digital Media Observatory	The European Digital Media Observatory (EDMO) operates as a hub for fact-checkers, academics, and other relevant stakeholders. One of its tasks is to build a public portal providing media practitioners, teachers and citizens with information and materials aimed at increasing **awareness**, building resilience to **online disinformation,** and supporting **media literacy** campaigns.

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In addition to the bodies listed above, it could also be argued that **(national) regulatory bodies** could play a role in raising awareness about certain skills-related mechanisms, such as Data Protection Authorities regarding privacy settings or the exercise of data subject rights, or Digital Services Coordinators regarding reporting mechanisms or settings regarding non-profiling-based recommender systems (see above).

As indicated in the D 7.3 policy recommendations, (media and technology) **industry** could also be involved in order to raise awareness about the different dimensions of digital skills. It has been established in many policy[8] and legislative documents that industry has an important role to play in relation to children's experiences in the digital environment (Livingstone et al., 2022, p. 87). The legislative framework, in particular, has been strengthened in terms of obligations that industry must respect. As explained above, certain of these obligations mandate installing certain mechanisms that require digital skills as regards their use (e.g. privacy settings, reporting mechanisms, settings to adjust recommender systems, complaints or other remedies). Industry could play an important role in enhancing both the knowledge and skills of children to use these mechanisms in an effective way. Some instruments require certain actors to explicitly promote media literacy, such as the AVMSD which requires video-sharing platform providers to do so. In the context of the Digital Services Act, the creation of an Age-Appropriate Design Code, as announced in the BIK+ Strategy, could also provide an opportunity to design guidance for platforms on how to contribute to child-friendly mechanisms and the promotion of digital knowledge andskills. Also in this respect, such guidance could enhance awareness about the different dimensions of digital skills and the factors that determine vulnerabilities.

A final group that should be involved in the (co-)creation and communication of policies that affect the promotion and enhancement of their digital skills is **children** themselves. This aligns with the emphasis on participation of children in political and democratic life in the EU Strategy on the rights of the child and would be in line with recommendations by the UN Committee on the Rights of the Child, in their General Comment No 25 on the Rights of the Child in the Digital Environment (para. 17).

4.5 Research

Recommendation 12, as listed in the set of recommendations towards EU policymakers from D 7.3, refers to the **necessity to continue to promote further research that could better inform policy and regulatory initiatives and implementation**.

Both the European Commission and the European Parliament invest in (carrying out) research that involves and concern children and informs policy and legal approaches. Funding has been channelled into research on children in the digital environment, including research on their digital skills in particular (i.e. ySKILLS), through **Horizon 2020**, a call-based EU research and innovation programme running over seven years (2014-2020). Horizon 2020 has been succeeded by **Horizon Europe**, the research and innovation programme for 2021-2027.

Besides the **ySKILLS** project that specifically focuses on children and their digital skills and wellbeing in the digital environment, the EU has also **funded** other research projects that relate to children and the digital environment and hence touch upon children's digital skills. Such examples are **EU Kids Online**, **DIGYMATEX, DigiGen and Children Online: Research and Evidence (CO:RE).**

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8 See, for instance, the BIK+ Strategy: The Commission invites industry to: monitor the impact of the digital transformation on children's wellbeing; invest in skills to increase awareness on children's diverse needs, fight stereotypes and to ensure digital accessibility in product development.

Further, within the policy instruments it adopts, the European Commission **recurrently highlights the necessity for and importance of further research on children's experiences in the digital environment or the impact of (specific) digital services or content on children**. While the **focus** is **not always on children's digital skills in particular**, the Commission signals an increasing need for future research that concerns children in the digital environment and involves children('s own voices). Often, the call for (the funding of) **further research relates to specific risks or opportunities children face in the digital environment**. In the **BIK+ Strategy**, for instance, the Commission holds that "children are now systematically exposed to inappropriate content and commercial practices" and hence "research on the long-term neurologic impact on children of methods used for commercial purposes such as persuasive design, for example games of chance mechanisms such as 'loot boxes'" is still needed. At the same time, the BIK+ promotes children-led activities and the input of children on digital topics (see, for instance, BIK Youth Ambassadors, BIK Youth Panels and the BIK Youth Pledge for a better internet), European funds that support Member States in their mandate (see, for instance, the European Regional and Development Fund [ERDF]), and supports the coordination and exchange of knowledge among Member States.

Calls for the support of further research on topics that may relate to children's digital skills also appear **in policy instruments that do not focus on children but have a link to the digital or skills** necessary for individuals' safe and/or active participation in the digital environment. The **Council conclusions on media literacy in an ever-changing world**, for instance, invite the Commission – within its areas of competence – "**to finance and foster systematic and regular research into media literacy and the impact of media and digital platforms**, including systematic research on media literacy measures and initiatives"; "research into the influence of new media and communication platforms on **well-being of citizens**"; "research into the operation of algorithms and AI and their influence on public opinion, people's lives, and media consumption, as well as on the European media and audiovisual industry)" (Conclusion no. 45). The call for evidence-based policymaking on media literacy relates to the ySKILLS recommendation on the need for further research as it includes a focus on citizens' critical thinking skills and, second, while it refers to people of all ages, it also concerns children.

The ySKILLS project urgently calls for further EU funding to support evidence-based policymaking in the field. The evidence base must be kept up to date, as the digital environment and its impact on children continue to evolve. ySKILLS findings point towards specific needs for future research. For instance, the results of the three-wave longitudinal survey show almost no direct impact of any of the digital skills dimensions on any of the examined well-being dimensions, although several associations between digital skills dimensions and the selected well-being indicators were identified. For instance, the psychological well-being, indicated by higher reported life satisfaction, was higher among children with higher communication and interaction skills and those who reported lower programming skills (Machackova et al., 2023, p. 52). Future research could further explore the indirect effect between the dimensions and well-being (Machackova et al., 2023, p. 53). Moreover, as the three-wave survey did not reveal a direct link between higher levels of digital skills and an increase in exposure to risks, except for the effect of content creation skills, ySKILLS also proposes more detailed research on the links between digital skills, activities, and online risks, to disentangle this effect (Machackova et al., 2023, p. 54). Finally, as highlighted in D 7.5 (Livingstone et al., 2023, p. 24), more work is needed in the future to establish why certain country contexts are more beneficial and which factors make for more favourable pathways towards better digital skills and literacy. More evidence is also needed on how coordination among different actors can "best support the development of longer-term beneficial outcomes from digital skills on children's well-being, participation, employability and life-long learning" (Livingstone et al., 2023, p. 24).

5. Turning ySKILLS recommendations into action points for EU policy

The mapping of the existing framework at EU level demonstrates increasing attention to children's empowerment and safe participation in the digital environment within various **policy** initiatives and instruments, both in areas where the EU has supporting (education, youth) and shared competences (internal market, justice, consumer protection). Building resilience and enhancing digital skills as a way to mitigate online risks and actively participate in the digital environment is a common goal across EU policies. Numerous policy documents contain elements that might contribute to the enhancement of digital skills. For children's digital skills in particular, **important commitments** are listed in the Strategy on the rights of the child, the Declaration on Digital Rights and Principles for the Digital Decade, and the BIK+ Strategy. It is crucial that these commitments are put into practice. At the same time, it has proven to be a complex endeavour to gain and maintain a comprehensive overview of all initiatives. Initiatives are taken across various policy areas, by different directorate-generals and with diverging focal points (e.g. workforce-specific or targeting citizens in general). In order to increase coordination, the EU could consider appointing a **youth Digital Skills Coordinator**, tasked with overseeing initiatives across different policy areas, directorate-generals and instruments.

Across policies, there is some but overall still limited attention given to the **diversity** of children and the factors that affect their **vulnerabilities**. Certain factors that might influence children's vulnerability in the digital age, such as low socioeconomic status, or poor health might need to be addressed by other types of policies (e.g. equality, health, poverty, etc.). As more evidence becomes available about certain vulnerabilities, such as mental health, more specific and consistent attention in EU policy is warranted. The same is true regarding the **different dimensions** of digital skills. As ySKILLS findings suggest, while multiple dimensions of digital skills are important, they develop unevenly, and they have differential outcomes (Livingstone et al., 2023, p. 35). In recent policy documents, references to critical thinking skills (especially in relation to disinformation) are prevalent, but skills in relation to communication and content creation receive much less attention. The **adoption and implementation of the yDSI** could offer valuable guidance in this regard. At the same time, future development and fine-tuning of the yDSI should be invested in, especially in light of new technological developments which may impact the dimensions of digital skills, and, hence, may require adjusting the tools to measure digital skills.

Many policy initiatives have been set up in relation to **digital education** in recent years. Whereas quite some of these initiatives focus on education in relation to employment, others do refer to digital skills in school curricula and training of teachers. As education falls within the supporting competences of the EU, it is not possible to enact legislation to, e.g., harmonise national school curricula. The scope of action is therefore limited to providing guidance and stimulating action at national level, for instance, through the sharing of best practices and promoting whole-of-government approaches. In this regard, **close cooperation between EU and Member States** is crucial. This could, for instance, happen within the context of the Structured Dialogue with Member States on digital education and skills within the Digital Education Plan (2021-2027).

There is an increasingly strong **legislative framework**, with a panoply of legislative instruments that have been adopted in recent years that might affect children in their relation to the digital environment. Some legislative instruments that are in place aim to combat offences in the digital environment, others aim to ensure that actors who offer services in that environment comply with obligations that achieve public policy goals that are at the heart of the European Union's values (safety, privacy, data and consumer protection). In this way, these instruments have an impact on the digital environment in which children grow up, ensuring that they encounter less illegal and harmful content or disinformation, their data subject rights are respected, and they are not the victim of illegal acts or unfair or manipulative practices. All of this might have direct impact on children's experiences

in the digital environment, and hence, perhaps an indirect impact on their digital skills and digital literacy. Whether this impact will materialise will need to be monitored very closely. Most instruments have been adopted or put into practice quite recently, so both **implementation and enforcement** are still in their early stages. The instrument with which there is some experience to date is the GDPR, where enforcement regarding the protection of children's data is slowly gaining momentum. In September 2023, for instance, the Irish Data Protection Commissioner imposed a fine of 345 million EUR on TikTok for its handling of children's personal data.[27] Enforcement is crucial, and the **regulatory authorities** that are tasked with enforcement will need to take up their responsibility. This includes authorities at the national level, such as national Data Protection Authorities, national media regulators, and national Digital Services Coordinators, but also the bodies at the EU level such as the European Data Protection Board, the European Regulators Group for Audiovisual Media Services and the European Digital Services Board. Cooperation across these instruments and policy areas might also be needed.

At the same time, the legislative instruments inherently do not focus on promoting or enhancing digital skills of children, although certain obligations that are imposed on companies also assume that users have digital skills. This is true, for instance, regarding the obligations in the DSA for platforms to provide users with user-friendly reporting mechanisms to report illegal or harmful content or the availability of certain privacy settings which might be required as part of the appropriate measures to ensure a high level of privacy, safety and security. For these mechanisms to be meaningful, children do need to have the skills to use them. This means that digital skills education must take into account the skills needed to **effectively use the legislative mechanisms** that are available to children. Finally, in any case, the discourse on skills should not take away from the responsibility of industry to comply with legal obligations (Livingstone et al., 2022; Livingstone et al., 2023, p. 30).

Promoting and enhancing children's digital skills requires the involvement of a diverse array of stakeholders. Several entities at the EU level, such as **regulatory, expert or working groups, coalitions, and observatories,** as well as **regulatory authorities** at the national level, can play a pivotal role in the communication of policies on digital skills, their different dimensions and factors that may give rise to vulnerabilities. The involvement of **media and industry** actors is equally crucial as they should be enlisted to heighten awareness on digital skills and must be furnished with guidance on how to take children's digital skills levels into account when designing their services, for instance in the context of the forthcoming Age Appropriate Design Code. And, of course, it is imperative to engage **children** themselves in the (co-)creation and dissemination of policies that affect the promotion and enhancement of their digital skills.

The EU has established a framework for **promoting and funding research that informs policymaking**. Within this framework, research projects either focused on or related to children's digital skills and well-being in the digital environment have received EU funding. Besides contributing to the understanding of the link between children's skills and well-being as they navigate the digital environment, such projects all underscore the need for further research and evidence-based knowledge in this domain. Calls for additional research and evidence-based knowledge on children and the digital environment (be it in relation to their well-being, skills, online risks and opportunities) also recurrently appear in policy instruments. As ySKILLS provides for a validated youth Digital Skills Indicator, and methodologies for measurement (surveys, performance tests, fMRI tests), a policy decision should be considered to **invest in more structural, longitudinal and cross-EU research which implements and keeps the yDSI up to date** in order to measure children's digital skills over time and across various geographical regions.

Building on our analysis, we have translated the ySKILLS policy recommendations into a number of **action points** for EU policymakers. While a consensus is emerging at international and European

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level to put the promotion and strengthening of digital skills on top of the policy agenda, the European Union can take up a **leading role** in this area. This requires a conscious choice to invest in the future of today's children, who grow up in a digital world.

ySKILLS Action Points

Conceptualisation, measurement and research

- Invest in structural, longitudinal and cross-EU research which implements the yDSI to measure the different dimensions of children's digital skills over an extended period and across various geographical locations.
- Invest in the future development and fine-tuning of the yDSI, especially in light of new technological developments which may impact the dimensions of digital skills.

Policies

- Appoint a yDSC: a youth Digital Skills Coordinator to oversee and coordinate initiatives regarding children's digital skills across various policy areas, directorate-generals, and instruments.
- Incorporate the granularity of the different dimensions of digital skills and vulnerabilities in EU policy on children's digital skills.
- Foster close cooperation with Member States to ensure the effective implementation of EU policies in the area of education and youth (supporting competences) at national level, for instance through the Structured Dialogue with Member States on digital education and skills.
- Monitor the progress and implementation of commitments outlined in the Declaration on Digital Rights and Principles in the Digital Decade.

Regulation

- Prioritise enforcement of the legislative framework, as proficiency in digital skills is insufficient to address certain online risks for children. It is imperative that companies design their services in a way that effectively mitigates these risks.
- Invest in the continuous monitoring and evaluation of the effectiveness of the current policy and legislative framework that might affect children's digital skills (even indirectly).
- Provide guidance on digital skills education that includes the necessary skills for effectively using legislative mechanisms such as privacy settings and reporting mechanisms, which are available to children to exercise their rights in the digital environment.

Communication and stakeholders

- Identify the relevant EU-level bodies that can actively participate in awareness-raising of policies on children's digital skills, and their different dimensions.
- Engage with industry stakeholders to promote and enhance the different dimensions of children's digital skills. This could encompass instructing children on the use of privacy settings, reporting mechanisms, complaints or other remedies, or the identification of disinformation (for instance, in the context of the Age Appropriate Design Code).
- Engage with children to (co-)create and communicate policies that affect the promotion and enhancement of their digital skills.

Acknowledgements

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