Digital Transformation and e-Citizenship. Children's Access to Online Services*

Michele Martoni**

Abstract. Digital transformation has rightly been described as a "total social fact". It is pervasive, ubiquitous, asymmetrical. It shapes things then relationships and individuals. Datafication, mediation and technological hypermediation connote new environments that people inhabit and where various forms of "digital pollution" (e.g. hate speech, falsehood, inadequate content, manipulation of behaviour, addiction) are to be expected. Focusing on children's access to online services, this contribution aims to develop an idea of e-citizenship, the realisation of which could be useful to protect freedom and rights in front of their growing compression between market and security policies

Keywords: Digital transformation, datafication, e-citizenship, digital literacy

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** Universidad de Urbino "Carlo Bo", Urbino, Italia; profesor de Derecho Informático. Doctor en Derecho Informático, Universidad de Boloña, Boloña, Italia. Contacto: michele.martoni@uniurb.it ORCID: 0009-0001-9093-5912.

Transformación digital y ciudadanía electrónica. Acceso de los niños a los servicios en línea

RESUMEN. La transformación digital ha sido acertadamente descrita como un "hecho social total". Es omnipresente, ubicua y asimétrica, moldeando objetos, relaciones e individuos. La datificación, la mediación y la hipermediación tecnológica configuran nuevos entornos habitados por las personas, en los cuales surgen diversas formas de contaminación "digital" (como la incitación al odio, la desinformación, los contenidos inapropiados, la manipulación del comportamiento y la adicción). Enfocándose en el acceso de los niños a los servicios en línea, esta reflexión pretende desarrollar una idea de ciberciudadanía, cuya implementación podría ser útil para proteger la libertad y los derechos frente a su creciente compresión entre las políticas de mercado y de seguridad.

PALABRAS CLAVE: transformación digital, datificación, ciudadanía electrónica, alfabetización digital.

Introduction

The collection of large volumes of data, the use of sophisticated analysis and profiling techniques, and the increasingly ubiquitous and pervasive interaction between humans and machines are known to affect individual freedoms and rights. As a result, the right to self-determination and the right to personal identity, among others, are being reinterpreted in the academic literature[1].

The concept of citizenship appears to be influenced by these developments, as it increasingly relates to "the set of conditions for a person to fully enjoy fundamental rights"[2].

1 *See*, for example, Avitabile, L., "Il diritto davanti all'algoritmo", *Rivista italiana per le scienze giuridiche*, 8, 2017, 315-327; Califano, L., "Brevi riflessioni su *privacy* e costituzionalismo al tempo dei big data", *Federalismi.it*, 9, 2017, 1-7; D'Acquisto, G., and Naldi, M., Big data *e* privacy by design, Turin, Giappichelli, 2017; Pizzetti, F., *Intelligenza artificiale, protezione dei dati personali e regolazione*, Turin, Giappichelli, 2017; Pizzetti, F., Privacy *e il diritto europeo alla protezione dei dati personali*, Turin, Giappichelli, 2016; Finocchiaro, G., "Riflessioni su diritto e tecnica", *Diritto dell'informazione e dell'informatica*, 4-5, 2012, 831-840; Resta, G., "Diritti della personalità: problemi e prospettive", *Diritto dell'informazione e dell'informatica*, 6, 2007, 1043-1071; Resta, G., "Identità personale e identità digitale", *Diritto dell'informazione e dell'informatica*, 3, 2007, 511-531; Zeno-Zencovich, V., "Informatica ed evoluzione del diritto", *Diritto dell'informazione e dell'informatica*, 1, 2003, 89-94.

2 Rodotà, S., *Tecnopolitica. La democrazia e le nuove tecnologie della comunicazione*, Rome, Laterza, 1997, 164. The translation is mine.

From this perspective, as we shall see, citizenship presupposes and necessitates educational, and training efforts aimed at fostering critical thinking and the ability to assess the impact of technological mediation on individual freedoms and rights.

There is a need to enhance skills to better understand the mechanisms underpinning technological platforms, as well as the interdisciplinary dynamics involved in IT mediation.

In this article, I will provide an initial overview of this scenario with a focus on minors, particularly addressing the phenomenon referred to as datafication. I will then highlight the specific risks minors face as a result of this transformation. Finally, I will offer reflections on digital citizenship (e-citizenship) education, arguing for its importance as a measure for risk prevention and mitigation.

I. New habitat and datafication

Digital transformation shapes new living environments –both analogue and digital– where individuals (users and citizens) act, interact, and are continuously challenged in a circular relationship between actions and feedback.

Marcel Mauss speaks of a 'total social fact,' and Garapon uses this concept specifically in reference to the transformation brought about by the massive use of digital technologies. This suggests that society does not become digital *per se*, but undergoes profound changes in the relational dynamics that constitute it at every level as a consequence of technological intermediation[3].

Floridi distinguishes between: technologies that improve, technologies that enhance and technologies that re-ontologise reality in informational terms. The latter reorganize and re-engineer reality by constructing a new one, which Floridi calls the "Infosphere"[4].

Floridi argues that the Internet is no longer merely a system of communication but has become the backbone of a new habitat[5]. In a similar vein, others, including Galimberti, have noted how technology has expanded to the point where it is no longer just a tool, but a world. When a phenomenon grows significantly in quantity, it simultaneously produces a radical qualitative change. As a result, technology is no longer simply at humanity's disposal, but becomes the very environment within which humans themselves are transformed[6].

3 Garapon, A., and Lassègue, J., *La giustizia digitale*, Bologna, Il Mulino, 2021, 79. For reference to the Maussian category *see* Mauss, M., *Saggio sul dono*, Turin, Einaudi, 2002.

4 On the distinction between technologies that improve, technologies that enhance and ultimately technologies that re-ontologise reality, *see* Floridi, L., *La rivoluzione dell'informazione*, Turin, Codice, 2012, 10-22. *See* also Floridi, L., *Infosfera. Etica e filosofia nell'età dell'informazione*, Turin, Giappichelli, 2009.

5 Floridi, L., *Il verde e il blu. Idee ingenue per migliorare la politica*, Milan, Raffaello Cortina, 2020, 65.

6 Galimberti, U., *I miti del nostro tempo*, Milan, Feltrinelli, 2018, 227. *See* also Galimberti, U., Psiche *e* techne. *L'uomo nell'età della tecnica*, Milan, Feltrinelli, 2021, 625; Durante, M., *Potere compu-*

We speak of datafication in the sense that technological intermediation transforms every action or event into data, codified in numerical terms. Life within the digital habitat thus initiates processes of transformation and adaptation, which, along with new modes of interaction, expose individuals to risks that demand careful evaluation.

The architecture that underpins this habitat and governs the process of datafication is the computer code that orients, shapes, deforms, and gives structure to the experiences it mediates. This code inherently involves choices; it exists as it does because of the intentions behind its conception and realization. It is not found in nature; rather, it is an artifact created according to the 'specifications' determined by its programmer.

Mediation recodes the sphere in which we experience our lives by filtering these experiences through a deterministic, non-immanent matrix that reflects the subjective vision of its creator. The code regulates our interactions, but it is also shaped by those who hold the power to define it. Thus, control of the code represents a form of power. As Lessig stated, "code is law"[7].

As a consequence of digital transformation, affecting numbers can potentially influence objects, facts, relationships, and agents. I will use the filter bubble and its impact on access to information as an example[8].

For the purposes of this article, I will focus, in particular, on how this phenomenon significantly affects so-called digital natives[9].

The period of adolescence emphasises the role of technologies in the process of self-determination. During this stage of growth and development, technology enables new paths of identity research and exploration. Some authors refer to the 'virtualisation of identity' as a process through which adolescents can experiment with the development of their personal identities[10].

tazionale. L'impatto delle ICT su diritto, società, sapere, Milan, Meltemi, 2019. The second chapter of this book is eloquently entitled "Tecnologia: da strumento ad ambiente". Finally, I would like to point out, Rodotà, S., *Il mondo nella rete. Quali i diritti, quali i vincoli*, Rome, Laterza, 2019.

7 Lessig, L., *Code and Other Laws of Cyberspace* [online], New York, Basic Books, 1999, available at: https://lessig.org/images/resources/1999-Code.pdf [last visited: September 20, 2024]; Maestri, E., "Stupri digitali: una questione di *governance* del cyberspazio", *Annali online della Didattica e della Formazione Docente*, 16, 27, 2024, 26-64, notes that two complementary normative levels operate in the internet, a level defined as technology-driven law, known as 'Code is Law', and a level defined as deontic-driven law, known as 'Law is Code'. *See* also Maestri, E., "*Lex Informatica* e *soft law*. Le architetture normative del cyberspazio", in Moro, P., and Sarra C. (eds.), *Tecnodiritto. Temi e problemi di informatica e robotica giuridica*, Milan, Franco Angeli, 2017.

8 *See* Pariser, E., *The Filter Bubble: What the Internet Is Hiding from You*, London - New York, Viking-Penguin Books, 2011.

9 On the expression "digital native" *see* Prensky, M., "Digital Natives, Digital Immigrants", *On the Horizon*, 2001, 9, 5, 1-6; Prensky, M., "Digital Natives, Digital Immigrants, Part II. Do They Really Think Differently?", *On the Horizon*, 2001, 9, 6, 1-6; Prensky, M., "Listen to the Natives", *Educational Leadership*, 63, 4, 2005, 8-13.

10 *See* Guarini, A.; Nicoletti, S. M. E.; Roga, F. *et al*., "Internet e *social*: i ragazzi raccontano le possibilità e i rischi della rete", *I Quaderni dell'Ufficio Scolastico Regionale per l'Emilia-Romagna*, 42, 2018, 61-71.

Social networks, blogs and other information society services therefore represent 'self-expressive possibilities for projecting oneself into the world[11].

In research by Schmitt *et al*., adolescents reported that personal websites help them convey their identity to others. In other words, for adolescents, putting up a real image of oneself does not necessarily mean exposing oneself to risks, but communicating oneself and being oneself[12].

There are over one billion children online. Each day, hundreds of thousands more go online for the first time. The digital world is not optional for children. It is the environment in which they access education, entertainment, and health services and build and maintain their relationships or engage in civic and social activities[13].

Livingstone, in research conducted at the London School of Economics and Political Science, observed that these young people are the first generation to be datafied from birth (and sometimes even earlier, as many people post pregnancy tests on social media)[14].

II. Some risks for digital natives

The concept of risk for digital natives usually includes everything directly or indirectly related to cyber-bullying behaviour[15].

However, this approach is reductive. As mentioned above, it is essential to consider the technical and economic dimensions of the network, including the intimate,

11 *See* Biolcati, R., "La vita *online* degli adolescenti: tra sperimentazione e rischio", *Psicologia clinica dello sviluppo*, XIV, 2, 2010, 267-297.

12 *See* Guarini, A.; Nicoletti, S. M. E.; Roga, F. *et al*., "Internet e *social*: i ragazzi raccontano le possibilità e i rischi della rete", cit., 61. *See* also Rivoltella, P.C., and Carenzio, A. (eds.), *Ragazzi connessi. I preadolescenti italiani e i nuovi* media, Rome, Pigmentum, 2008. Similar considerations, albeit with the necessary obvious adjustments, could be made with reference to the childhood period. Recent research shows, in fact, that technologies exert an impact on development already at this early stage of growth.

13 UNICEF Office of Research-Innocenti, *Growing Up in a Connected World* [online], 2019, available at: https://www.unicef.org/innocenti/media/7006/file/GKO-Summary-Report-2019.pdf [last visited: September 20, 2024].

14 *See* Stoilova, M.; Livingstone, S., and Nandagiri, R., *Children's Data and Privacy Online: Growing Up in a Digital Age* [online], 2019, available at: http://www.lse.ac.uk/media-and-communications/research/research-projects/childprivacyonline [last visited: September 20, 2024]; Livingstone, S., "Children: a Special Case for Privacy", *Intermedia*, 46, 2, 2018, 18-23.

15 Italian law No. 71 of 2017 defines cyber-bullying as "any form of pressure, aggression, harassment, blackmail, insult, denigration, defamation, identity theft, alteration, unlawful acquisition, manipulation, unlawful processing of personal data to the detriment of minors, carried out by telematic means, as well as the dissemination of online content targeting also one or more members of the minor's family whose intentional and predominant purpose is to isolate a minor or a group of minors by means of serious abuse, harmful attack, or ridicule" (the translation is mine).

architectural nature of a data-driven society, the role of algorithms, and the consequences of prolonged human-machine interactions[16].

The risks to be assessed are therefore not limited to unlawful conduct, but also include those intrinsic to the very functioning of the information society and the experience of living within it.

It is important to remember that the digital environment is entirely created by humans and primarily designed to serve the business interests of companies and their shareholders. The main goals of technology companies are to increase the number of service users, maximize time spent on platforms, and boost engagement – all of which generate more personal data used to drive advertising revenue. More attention, views, and clicks result in higher profits. The idea of a digital world that respects rights, where children are both early adopters and active participants, contrasts sharply with the current reality, which emphasizes safety but often fails to adequately protect children. Additionally, little attention is given to concepts of childhood, evolving capacity, or the societal norms that have long safeguarded the rights and privileges of children at various stages of their development[17].

A significant amount of research on child development was conducted before the advent of the digital age. As technology evolves faster than studies on its effects, it is challenging to gain a clear understanding of its impact. The World Wide Web is only 35 years old and has been widely accessible to children in connected countries for just the last 15 years. More than any other innovation, the internet's portability, personalization, profiling, and virality allow children to engage in a global network with considerable autonomy and visibility from a very young age[18].

There is interesting research highlighting the relationship between the awareness of being constantly monitored and psychic development[19]. Some scholars question, for example, what the impact on minors might be of the "quantified self" (which involves monitoring multiple personal data: reading speed, sleep levels, bowel movements and other usually strictly private data)[20]; of the use of smart watches, GPS trackers or other geolocation systems; or of smart toys[21].

16 *See* Avitabile, L., "Il diritto davanti all'algoritmo", cit. *See* also *Article* 29 *Data Protection Working Party, Opinion 2/2009, on the Protection of Children's Personal Data (General Guidelines and the Special Case of Schools)*, 398/09/EN, WP 160.

17 *See* OECD, *Children in the Digital Environment. Revised Typology of Risks*, 302, 2021, 4.

18 *See ibid*., 5.

19 *See* Brown, M.; Coughlan, T.; Lawson, G. *et al*., "Exploring Interpretations of Data from the Internet of Things in the Home", *Interacting with Computers*, 25, 3, 2013, 204-217.

20 The term first appeared in 2009, in the monographic issue of Wired "Living by Numbers". The manifesto of the quantified self is, however, contained in Wolf's article, "The data-driven life", published in *The New York Times Magazine* on 28 April 2010.

21 *See*, for example: https://www.theguardian.com/sustainable-business/2016/mar/29/smart-toys-lazy-parents-internet-of-things-hello-barbie [last visited: September 20, 2024]. *See* also: https://www.designcouncil.org.uk/news-opinion/will-internet-things-set-family-life-back-100-years [last visited: September 20, 2024].

In 2021, 5Rights Foundation published *Pathways*, a research study looking at how digital products and services impact the lives of children. Using avatars (online profiles based on real children), the research showed how design features of popular services among children enabled automated pathways that led to graphic images of self-harm, extreme diets, pornography and introduced them to adult strangers.

The 5Rights Foundation released in October 2023 an update of the report *Digital Childhood. Addressing childhood development milestones in the digital environment*[22]. This updated version of the *Digital Childhood* report examines the current landscape of children's digital and technology use in 2023. It highlights once again how growing up in a digital environment directly influences a child's developmental path, concluding that a carefully managed transition from childhood to adulthood is just as crucial in the digital world as it is offline. The report reviews each age group, detailing what we know about child development and the key digital interactions and their impact at that stage. Where research evidence exists, it is referenced, and where the authors have drawn from their professional experience, it is noted.

Kidron in the report *Disrupted Childhood: The cost of persuasive design* examines the persuasive design features and strategies common to many popular digital products and services used by children today and consider their impact on children's social, mental and physical development[23].

The Children's Commissioner for England, Anne Longfield Obe, in the document *Who knows what about me?* divides the possible risks into: short-term risk (as children) and long-term risk (as young people and adults)[24]. The first category (short term risk) includes, for example: cyber-bullying; identity theft; online grooming. The second category of risks (long term risk) includes increased exposure to identity theft, on the one hand, and the risk on future opportunities and chances, on the other. On the first aspect, the document points to an increased risk of identity theft due in particular to the increasingly widespread practice of sharenting, i.e. the sharing of information (such as: photo, home address, name and surname, place and date of birth, school attended, sport practised and place of training) on social networks by parents themselves[25].

The second aspect reflects on the possibility that this growing volume of data, coupled with the innovative methods of analysis, could lead to limited future opportunities and chances. Data collected during the childhood period could in fact

22 For more details *see*: https://5rightsfoundation.com/wp-content/uploads/2024/08/Digital-Childhood-Report-2023.pdf [last visited: September 20, 2024].

23 *See*: https://5rightsfoundation.com/wp-content/uploads/2024/08/5rights_DisruptedChildhood_G.pdf [last visited: September 20, 2024].

24 Longfield Obe, A., *Who Knows What About Me?* [online], available at: https://www.childrenscommissioner.gov.uk/wp-content/uploads/2018/11/who-knows-what-about-me.pdf [last visited: September 20, 2024].

25 *See*: https://www.bbc.com/news/education-44153754 [last visited: September 20, 2024]. *See* also Steinberg, S., "Sharenting: Children's Privacy in the Age of Social Media", University of Florida Levin College of Law, Legal Studies Research Paper, 2016, 16-41.

compose the profile of the person, and be used in automatic or semi-automatic decision-making processes[26]. For the digital natives –conceived, born and raised immersed in the digital world– the profiling process can, therefore, be fuelled by multiple pieces of information that, drawing on different aspects and periods of life, will allow a more extensive and consolidated view of the individual over time[27].

In 2011, the OECD introduced "typology of risks" to broadly categorize various risks. However, the digital environment has changed substantially since then, with risks evolving and new ones emerging. So, in 2023, the OECD released an update. This revised report offers a high-level overview of the current risk landscape, detailing four main risk categories and their manifestations. It also highlights and examines risks that span across these categories, potentially having far-reaching impacts on children's lives[28]. The revised document provides a high-level and overarching overview of the different types of risks that children may face in the digital environment. It discusses four risk categories, namely: i) Content Risks; ii) Conduct Risks; iii) Contact Risks; and iv) Consumer Risks. The Typology also identifies risks that cut across these four risk categories and can have wide ranging impacts on children's lives. These are: i) privacy risks; ii) advanced technology risks; and iii) health and wellbeing risks. Various forms of exploitation can also pose risks to children in the digital environment, such as sextortion. New concerns have arisen, including the spread of misinformation or disinformation (i.e. fake news) and situations where children engage in peer-to-peer exchanges, making their own behaviour a source of vulnerability (conduct risks). Today, children may encounter new types of deceptive or fraudulent commercial practices. They may also be exposed to marketing strategies that blur the line between commercial and non-commercial content. Additionally, children may

26 *See*: https://ico.org.uk/for-organisations/guide-to-data-protection/guide-to-the-general-data-protection-regulation-gdpr/automated-decision-making-and-profiling/what-is-automated-individual-decision-making-and-profiling/ [last visited: September 20, 2024].

27 Profiles are generally used: to determine a person's preferences; to make predictions about future behaviour; to make decisions based on them. One of the major uses of profiling is in advertising practices, but profiling is also starting to be used in more sensitive areas (e.g. creditworthiness assessment, personnel selection, insurance risk assessment, support for judicial decisions and administrative measures, student selection by universities). For a more in-depth look at the topic of marketing to children, *see*: https://ico.org.uk/for-organisations/guide-to-data-protection/guide-to-the-general-data-protection-regulation-gdpr/children-and-the-gdpr/what-if-we-want-to-target-children-with-marketing/ [last visited: September 20, 2024]. These data processing and analysis techniques are fallible. The Centre of Data Ethics and Innovation set up by the British government stated that automated decision-making can be opaque and, in certain contexts, may lead to unfair outcomes or overly restrict the level of control we have over the decisions that shape our lives. Similarly, the report released by the Science and Technology Committee of the House of Commons and entitled "Algorithms in decision-making" emphasises the so-called algorithmic biases, i.e. the discriminations and errors into which the algorithm can fall. In particular, the report identifies four causes that can give rise to bias: (i) inappropriate training data; (ii) insufficient data; (iii) confusion of correlation with causation; (iv) lack of representation in the algorithm development community. Research on explainability is interesting on this point. *See*: https://ico.org.uk/media/2615039/project-explain-20190603.pdf [last visited: September 20, 2024].

28 *See* OECD, *Children in the Digital Environment. Revised Typology of Risks*, cit.

be targeted by advertising based on personal data collected from them, which raises concerns regarding privacy, finances, and security. There are still instances where children are exposed to illegal or age-inappropriate products. With the vast amount of personal information collected, processed, and shared through advanced technologies like artificial intelligence and predictive analytics, children's data may be used for profiling, potentially impacting their fundamental rights and freedoms. A child's age and maturity may affect their ability to understand the intent behind such data collection and usage, as well as the long-term privacy implications[29].

A further element of vulnerability to be considered is the lack of critical skills and capabilities. Digital natives are usually referred to as fluent in the digital language of computers, video games and the Internet[30]. This is a myth. Various researches show that, in reality, digital natives, despite having grown up immersed in technologies, are not experts on how to use them correctly. The Programme for International Student Assessment (PISA) or the Programme for the International Assessment of Adult Competencies (PIAAC), of the Organisation for Economic Cooperation and Development (OECD), indicate that a high proportion of people have insufficient basic skills[31].

These data get even worse if, instead of competence in the use of technologies, one assesses the ability to exercise a critical and conscious approach to digital environments. Although digital natives show some skill in the use of applications, they do not have adequate knowledge of the tools, contexts, platform logics, languages and mechanisms of communication and data processing. There is, therefore, a lack of competence and awareness of the opportunities, but also of the risks, associated with the use of technologies[32].

29 *See ibid*.

30 *See* Prensky, M., *Listen to the Natives*, in *Educational Leadership*, cit., 8.

31 *See* PISA 2015 [online], available at: *https://www.oecd.org/pisa/* [last visited: September 20, 2024]; Education and Training Monitor 2016 [online], available at: https://ec.europa.eu/education/policy/strategic-framework/et-monitor_en [last visited: September 20, 2024]; Digital Scoreboard 2017 [online], available at: https://ec.europa.eu/digital-single-market/en/digital-scoreboard [last visited: September 20, 2024]. More recently *see* Syayyidah, M. J., "Analysis Level of Digital Literacy of Digital Natives: How the Impact on Their Self-Regulated Learning?", *Ekspektra Jurnal Bisnis dan Manajemen*, 2019, 3, 173; Sánchez-Caballé, A.; Gisbert, M., and Esteve, F., "The Digital Competence of University Students: A Systematic Literature Review", *Aloma. Revista de Psicologia, Ciències de l'Educació i de l'Esport*, 2020, 38, 1, 63-74; Janschitz, G., and Penker, M., "How Digital Are 'Digital Natives' Actually? Developing an Instrument to Measure the Degree of Digitalisation of University Students. The DDS-Index", *Bulletin of Sociological Methodology - Bulletin de Méthodologie Sociologique*, 2022, 153(1), 127-159; Tóth, T.; Virágh, R.; Hallová, M.; Stuchlý, P. e Hennyeyová, K., "Digital Competence of Digital Native Students as Prerequisite for Digital Transformation of Education", *International Journal of Emerging Technologies in Learning (iJET)*, 2022, 17(16), 150-166. *See* also Report Openpolis, Osservatorio povertà educativa #conibambini [online], *Disuguaglianze digitali*, 14 luglio 2020, available at: https://www.openpolis.it/wp-content/uploads/2020/07/Disuguaglianze-digitali.pdf [last visited: September 20, 2024].

32 *See* Lazzari, M., "Adolescenti e rischi di Internet: la competenza digitale non basta", *Didamatica*, 2016, 1-10.

III. Education as a mitigation measure

The process of adaptation and modes of interaction mean that living conditions in this habitat can be ploblematic and insecure. Insecurity and vulnerability affect users not only as individuals but also as part of an eco-system.

In this scenario, rules, prohibitions, and sanctions are insufficient. Law is not enough because it has to cope with what is born as a behaviour and consolidates into a lifestyle (and then into a mass culture).

A total transformation, such as the one underway requires –as Floridi states– "a new kind of education and sensitivity", the ability to implement new lifestyles that have rightly been called counter-cultural.

This is where what is now commonly referred to as 'e-citizenship' comes into play. On closer inspection, the very concept of citizenship must be reread broadly, encompassing the conditions necessary for individuals to fully enjoy their fundamental rights[33].

From this perspective, the concept of citizenship, as we shall see, presupposes and requires educational and training work, a true digital literacy, capable of facilitating the development of a critical sense and the ability to make judgments on the effects that the intermediation of technologies produces on personal freedoms and rights.

Skills need to be enhanced to understand the underlying mechanisms of technology platforms, as well as the dynamics inherent in digital intermediation[34]. Some skills are technical, those who can programme and use open-source tools have more agency in the digital environment and more facility to use those design features that exist to support them. But skills such as collaborative working, an iterative mindset, curiosity, critical thinking or non-technical subject knowledge that understands the purposes and practice of the technology children are using can be as important as technical skills.

The provision of a sophisticated and holistic approach to digital literacy and critical thinking could significantly support a child's evolving capacity in the digital world. However, it cannot compensate for poor design, toxic environments, or the unrestricted access to adult services by children. In this context, it is essential to eliminate elements that can distort individual freedom of choice and consensus due to power asymmetries related to culture, income, and the market's influence. With-

33 Rodotà, S., *Tecnopolitica. La democrazia e le nuove tecnologie della comunicazione*, cit., 164.

34 On digital citizenship education *see*, among others, Amato Mangiameli, C. A., and Campagnoli, M. N., *Strategie digitali. #diritto_educazione_tecnologie*, Turin, Giappichelli, 2020; Pascuzzi, G., *La cittadinanza digitale. Competenze, diritti e regole per vivere in rete*, Bologna, Il Mulino, 2021; Marzocco, V.; Zullo, S., and Casadei, T., *La didattica del diritto. Metodi, strumenti e prospettive*, Pisa, Pacini giuridica, 2021; Bello, B. G., *(In)giustizie digitali. Un itinerario su tecnologie e diritti*, Pisa, Pacini giuridica, 2023.

out removing these asymmetries, the manifestation of consensus is reduced to the result of various conditioning factors[35].

In this sense, a training and educational path that reveals the mechanics of this new world, places individuals outside the magic circle (unveiling its tricks), and neutralizes asymmetry should be considered favourably as a condition of free self-determination and a constitutive element of the concept of citizenship. I argue that understanding the technological dimension is a prerequisite of citizenship as it enables free informational self-determination. For this reason, and with this in mind, there is a need for digital literacy.

Recent years have seen a proliferation of initiatives focused on digital citizenship education. However, these are often sporadic, emergency activities, that are not adequately designed for long-term effectiveness or integrated into the school curriculum.

Only a few actions can be considered good practice. In the words of Richard Buckminster Fuller, "we are called to be the architects of the future, not its victims. Our time enjoys [...] extraordinary and unprecedented abundances but finds itself orphaned of the fulcrums on which to rest the prodigious levers made available by technology". "We need a model of proactive learning, making and telling, creating and engaging, with curiosity as the central stimulus"[36].

The ultimate goal should be to build the capacity to act as responsible citizens and to participate fully in civic and social life, based on an understanding of social, economic, legal and political structures and concepts[37].

It is therefore necessary to focus on interdisciplinary skills and critical awareness to enhance the ability to make informed choices.

Casadei observes that citizenship has become a crossroads of diverse and complex elements involving an individual's political-legal identity, modes of political participation, and the full spectrum of rights and duties. The complexification of citizenship and the variety of "meaning structures" underlying it necessitate a growing number of skills for its study. Therefore, interdisciplinary approaches are particularly useful, especially when the ideal goal is to educate for citizenship[38].

35 *See* Rodotà, S., *Tecnopolitica. La democrazia e le nuove tecnologie della comunicazione*, cit., 150.

36 *See* Versari, S., "Tra righe e sporgenze: si può vivere di emergenze?", in AA.VV., *Riflessioni* social… *con le mani in rete*, in *I Quaderni dell'Ufficio Scolastico Regionale per l'Emilia Romagna*, 42, 2018, 8. The translation is mine.

37 *See* European Union Council Recommendation of 22 May 2018 on key competences for lifelong learning (2018/C 189/01). *See* also Digital Competence Framework for Educators (DigCompEdu) [online], available at: https://joint-research-centre.ec.europa.eu/digcompedu_en [last visited: September 20, 2024]; European Commission, Digital Education Action Plan 2021-2027; European Union Council Recommendation on improving the provision of digital skills and competences in education and training, November 23, 2023, 15740/23.

38 *See* Marzocco, V.; Zullo, S., and Casadei, T., *La didattica del diritto. Metodi, strumenti e prospettive*, cit., 110-111.

A testimony to what I have highlighted so far is the experience of the italian municipal project "Together on the Net (Insieme nella Rete) - A widespread and shared cultural system for digital citizenship"[39].

The project was structured into four actions: (i) teacher training; (ii) peer educator training; (iii) a series of meetings with families, and (iv) testing the digital citizenship curriculum in classrooms.

The first action consisted of in-depth meetings on various topics, including: the information society and the classification society; hardware and the web; coding and computational thinking; online rights; personal data protection; safe use of technologies; augmented reality applications; research and evaluation of information and digital content; use of applications for educational purposes; big data, open data, smart cities and civic participation; cyber-bullying and online misconduct.

In the second action, groups of students were sensitised and trained to become peer educators. They then met students from all the schools involved in the project, serving as a reference point and guide for their younger peers. The training for peer educators focused on the conscious use of technologies, the data society, personal data protection, cyber-bullying and illegal conduct online, as well as various ways for use technologies for content dissemination.

Under the guidance of experienced educators, the peer education approach was combined with the gamification, which engages students actively in the learning process and makes it more effective.

Several peer educators, through the municipal youth council, were involved in the conception and realization of a role-playing game, a team game set in a fantasy world where young explorers follow a map to visit different thematic villages, facing missions related to safety and conscious use of technologies. The setting, playing and non-playing characters, and character sheets with history, details and equipment were all created. Within the story, characters must use skill scores to solve puzzles through intuition, equipment and cooperation with other characters involved in the adventure. The game was designed to avoid violence; instead of typical "hit points", characters have "empathy points" which, if lost, prevent the character from playing, requiring the group to help them recover. The aim was to create a symbolic and direct experience of the complex and critical situations in which young people are immersed daily by enhancing group cooperation and mutual aid. All this through an imaginary world entirely created by the young people.

The family, as the focus of educational action, was the protagonist of the third action, which includes meetings, film forums, and workshop activities aimed at extending the critical, constructive, and cultural approach that identifies the project. This was followed by an initial experimental activity for the 0-6 age group, which is increasingly engaged with these issues.

39 The project involves schools at all levels in the municipality of Imola, in the province of Bologna, Italy.

All of this converged in the fourth and final action: the experimentation of the digital citizenship education curriculum, which involved teachers and peer educators with the support of families. This experimentation covered all classes across the various schools, with a particular focus on the 11-15 age group.

Conclusions

The urgency is to restore freedom to individual conviction and determination. This can only happen through structured and ongoing literacy activities, along with a rethinking of the roles of politics, law, and technology in response to the ethical challenges of the new digital environment.

There is a need to rethink the skills and capacities that the education and training system must be able to impart in order to increase the resilience of digital natives and to guarantee them the effective exercise of citizenship rights, including the right to personal identity and informational self-determination; there is a need for a rethinking of technologies –guided by politics, along the lines of the British example mentioned above– whose design must be oriented according to ethical choices that protect the freedom of the individual, not barricaded behind the scheme of (asymmetric) consent alone.

Politics must regain its strategic and visionary role; otherwise, mercantilism will continue to dictate its business-oriented rules undisturbed, to the detriment of many fundamental rights of the individual and the principles underpinning democratic systems[40].

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40 *See* Levy, P., *Cyberdemocrazia. Saggio di filosofia politica*, Milan, Mimesis, 2008; Carayannis, E. G.; Campbel, D. F. J., and Efthymiopoulos, M. P., *Cyber-Development, Cyber-Democracy and Cyber-Defense*, New York, Springer, 2014.

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