



**Universität
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Fakultät für
Psychologie



Youth and the Participatory Promise

Inaugural Dissertation

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From Poschiavo

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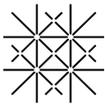


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Statement of Authorship

I hereby declare that I have written this thesis independently without the help of third parties other than those acknowledged. I only used the resources indicated and I marked all the citations.

My dissertation includes this synopsis and the following publications:

Articles in Journals (Peer-Reviewed)

- Brossi, L., Castillo, A. M., Cortesi, S., Lombana-Bermudez, A., Olivera, M. N., Passeron, E., Valdivia, A. (forthcoming). Youth practices and skills in a digital age: Perspectives from Argentina, Colombia, Chile and Uruguay. [Manuscript submitted for publication] *Global Studies of Childhood*.
- Cortesi, S., & Gasser, U. (2015). Youth online and news: A phenomenological view on diversity. *International Journal of Communication*, 9(2015), 1425-1448. <https://perma.cc/P6HM-JZVC>
- Cortesi, S., & Hasse, A. (forthcoming). Youth and participatory research: Opportunities and challenges from academia. Manuscript submitted for publication] *Journal of Participatory Research Methods*.

Chapters in Books (Peer-Reviewed)

- Gasser, U., & Cortesi, S. (2017). Children's rights and digital technologies: Introduction to the discourse and some meta-observations. In M. D. Ruck, M. Peterson-Badali & M. Freeman (Eds.), *Handbook of children's rights: Global and multidisciplinary perspectives* (pp. 417-436). Routledge. <https://perma.cc/4259-YXJ6> [45 pages]
- Plunkett L., Cortesi, S., & Gasser, U. (2019). Student privacy and the law in the internet age. In K. Bowman (Eds.), *The Oxford Handbook of U.S. Education Law*. Oxford University Press. <https://perma.cc/7NEZ-CGQG> [24 pages]

Online Publications (Peer-Reviewed)

- Cortesi, S., Hasse, A., Lombana-Bermudez, A., Kim, S., & Gasser, U. (2020). *Youth and digital citizenship+ (plus): Understanding skills for a digital world*. Berkman Klein Center for Internet & Society at Harvard University. <https://perma.cc/9VEJ-HNB2> [92 pages]
- Hasse, A., Cortesi, S., Lombana-Bermudez, A., & Gasser, U. (2019). *Youth and artificial intelligence: Where we stand*. Berkman Klein Center for Internet & Society at Harvard University. <https://perma.cc/W96Q-9T7K> [20 pages]
- Lombana-Bermudez, A., Cortesi, S., Fieseler, C., Gasser, U., Hasse, A., Newlands, G., & Wu, S. (2020). *Youth and the digital economy: Exploring youth practices, motivations, skills, pathways, and value creation*. Berkman Klein Center for Internet & Society at Harvard University. <https://perma.cc/2KC4-K5RX> [67 pages]

All publications are original work. I contributed substantially and independently to all publications. I have been jointly responsible for the ideas, conception, data collection, analyses, and/or writing of all publications.

A more comprehensive list of publications I have written and edited during the time of my dissertation can be found in the Appendix.

Basel / January 28, 2021

Sandra Cortesi: S. Cortesi



YOUTH AND THE PARTICIPATORY PROMISE

By Sandra Cortesi

Abstract

The emergence of digital technologies and the ways we have seen many youth engaging with the digital environment suggests that youth may no longer be just passive consumers of digital technologies but that — given the right circumstances — can become more active co-designers and co-shapers of the digital environment. This promise of enhanced participation is supported by two strands of research. First, from a purely descriptive perspective, my research shows increased participation when studying youth behavior in various areas, including privacy and news. Second, from an analytical and normative perspective, we can observe a trend — and should support the potential — of stronger youth engagement and an increase in opportunities for youth to participate as we shape the future of our digital society. The implementation of participatory research methods and the child rights discourse illustrate this participatory potential. Together, the two perspectives suggest a “participatory promise,” in which young people have an integral and constitutive role when embracing the benefits and addressing the challenges of the digital environment and shaping its future.

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Glossary

(A Person’s) Ability

In Cortesi et al. (2020) we have defined “ability” as the capacity to apply practical and physical, cognitive and meta-cognitive, and social and emotional skills.

Access

When talking about “having access to digital technologies,” I am primarily referring to having physical access to an Internet accessible device (e.g., smartphone, laptop, desktop computer, or more emergent technologies like a smartwatch or home assistants, such as Google Home), as well as the necessary technological infrastructure (i.e., Internet connectivity). Yet, importantly, “access” in the context of divides and inequalities connotes not only access to digital technologies, but access to (social, human, and learning) resources that support (economic, social, and cultural) capital-enhancing modes of participation. See also Lombana-Bermudez, Cortesi, et al. (2020a) and Shah (2017).

Agency

I am perceiving agency as the individual and/or collective ability — contextually contingent (i.e., socially embedded and culturally and economically mediated) — of youth to make decisions and take action toward their own life and well-being. See also DeJaeghere et al. (2016).

Civic and Political Participation

In Cortesi et al. (2020) we have defined civic and political participation as the ability to participate in public matters (e.g., LGBTQ rights; peace building; addressing hate speech) and advocate for issues one cares about — using digital and non-digital tools — ideally to improve the quality of life in one’s community, from micro to macro levels.

Digital Technologies

I am referring to “digital technologies” as an overarching term that encompasses the Internet, mobile technologies, digital networks and databases, digital contents, platforms, and services, along with additional, diverse information and communication technologies, including more emerging technologies such as artificial intelligence, robotics, augmented and virtual reality, algorithms, “big data,” and the “Internet of things.” In most cases, I will likely be referring to the “digital technologies” as the Internet, smartphones, and social media grouped together.

Participation

There is little agreement on how participation should be conceptualized or be defined (Carpentier, 2016). However, broadly speaking, there are two main approaches to participation — a sociological and a political (studies) approach. The sociological approach defines participation in relatively broad terms, including “many (if not all) types of human interaction, in combination with interactions with texts and technologies” (Carpentier, 2016, p. 71). The political approach is seen as more narrow, conceptualizing participation as “the equalisation of power inequalities in particular decision-making processes” (Carpentier, 2016, p. 72). For the purpose of this synopsis, I’m using a broader, nuanced framework of participation, acknowledging a wide range of activities

across different offline and online spaces, communities, institutions, and practices. Participation, to me, is a dynamic (rather than gradual or linear) process and includes varying degrees of participation. Youth participation is embedded into a larger context and in that regard, I find Henry Jenkins' five guiding questions tremendously valuable:

“1) Participation in what? How do the participants understand their own participation — as part of a public, a market, an audience, a fandom, etc.? To what degree do they identify as part of a community or network which is larger than the individual? This focus on collective life sets a theory of participatory culture at odds with many critical accounts of neoliberalism which emphasize more individualized and privatized conceptions of public life. 2) Participation for whom and with whom? Who is included and who is excluded? What mechanisms of exclusion and marginalization persist despite the increased opportunities for participation? 3) Participation towards what ends? What are our participatory activities trying to build? What do we hope to achieve in working together? 4) Participation under what terms? What constraints are imposed by the technological, economic, political, and legal systems within which we operate? 5) Participation to what degree? What are the limits on the power that comes from a more participatory culture?” (Jenkins, 2019, part 1)

Overall, I am trying to resist my own adult-normative inclination to perceive some participation as more valuable or desirable (as even more mundane activities can lead to powerful outcomes; see also section 4.1). A well-accepted framework colleagues are using is the concept of a “ladder” of participation (Livingstone, Kardefelt-Winther, Kanchev, et al., 2019). While I am not adopting such a concept, I very much appreciate its aspirational goal and its need for us to define (or ideally co-define with youth) what it takes and means to get to the top of the ladder. I also acknowledge and address in my work that not every young person is participating under the same terms (see for instance Cortesi et al., 2020; Lombana-Bermudez, Cortesi, et al., 2020a) — significant disparities in participation persist for youth across multiple dimensions, such as geographic location, skill and education level, social class, race, age, and gender.

Skills

I am working with the term “skills” as defined by the OECD (OECD, 2018). According to the OECD (2018), skills encompass 1) practical (e.g., utilizing new digital technology devices) and physical (e.g., using a digital device, such as a tablet or mobile phone, to achieve a specific outcome, like finding information online for a school assignment) skills, 2) social and emotional skills (e.g., collaboration, self-efficacy, empathy), and 3) cognitive and meta-cognitive skills (e.g., self-regulation, motivation to learn, creativity, and critical thinking) (p. 5). For a comprehensive discussion of the theme, please see Cortesi et al. (2020).

Youth

People use a variety of terms to refer to youth, such as: “youth,” “young people,” “minors,” “children,” “younger children and older children,” “preadolescents,” “adolescents,” “teens,” “teenagers,” “younger teenagers and older teenagers,” and “older youth.” A review of the literature suggests that these terms are used interchangeably in an ambiguous manner, and that they do not carry with them a commonly accepted definition. For the purpose of my work, I have chosen to categorize people ages 12-18 as “youth” or “young people.” In the United States, people over the

age of 18 are legally considered to be adults. I choose to follow the institutional category of adults/minors because, even if “youth” represents a social and legal construct, such social and legal effects define and shape social experience. I understand that “youth” isn’t a homogenous group and that there are power differentials not only between youth and adults but also among categories of youth. I acknowledge the diversity that exists, whether in terms of age, ethnicity, race, gender and sexual identity, religion, national origin, location, skill and educational level, socioeconomic status, and/or power differential and I am aware of the complexity that comes with using the term “youth.”

1. Puzzles, Research Questions, and Synopsis Structure

Over the past several years, there has been a significant increase in youth’s “access” to digital technologies and “ownership” of Internet accessible devices, particularly smartphones. In addition to having access to a greater number of devices and being able to go online more easily, many youth now also have access to a greater variety of online platforms (M. Anderson & Jiang, 2018b; Livingstone et al., 2019; Rideout & Robb, 2019; Smahel et al., 2020; Suter et al., 2018). One of the promises of this digital transformation is that as youth grow up immersed in this new digital world, increasingly able to access and use digital tools and platforms to search, find, consume, curate, create, share, and engage with content online, they will be able to increasingly participate online — in terms of quantity and quality (Cortesi & Gasser, 2015; Gasser et al., 2012; Gasser & Cortesi, 2017; Lombana-Bermudez, Cortesi, et al., 2020a; Palfrey & Gasser, 2008, 2016). And some young people are in fact avid and passionate users, consumers, and producers of digital technologies and invest significant time and energy to leverage opportunities around creativity, learning, entrepreneurship, and innovation (Brossi et al., 2018; Hargittai, 2010; Lombana-Bermudez, Cortesi, et al., 2020a; Palfrey & Gasser, 2016).

However, research also demonstrates that not all young people are able to access digital devices, possess the relevant skills and agency (i.e., the disposition to use technology to intervene in the world around them), and leverage digital technologies equally — significant differences still exist among those who can and those who can’t participate (Cortesi et al., 2020; Lombana-Bermudez, Cortesi, et al., 2020a; Watkins et al., 2018). In fact, scholars have noted the possibility that the digital transformation may even exacerbate existing inequalities and, by extension, reduce even more so opportunities for participation (Cobo, 2020; Cortesi et al., 2020; Hargittai, 2010; Lombana-Bermudez, Cortesi, et al., 2020a; Watkins et al., 2018). Inequalities can come, for instance, in the form of unequal access to technologies, unequal development of the relevant skills needed for meaningful participation, and the disparate benefits of technology usage according to socioeconomic status. The majority of inequalities intersect with diversity and inclusion demographic categories such as ethnicity, race, gender, national origin, location, age, and educational (skill level) and/or socioeconomic status (Cobo, 2020; Cortesi et al., 2020; Lombana-Bermudez, Cortesi, et al., 2020a; Third et al., 2017; Watkins et al., 2018).

Both the promise of digital technologies and the persisting barriers to youth engagement, whether in form of connectivity issues or skill gaps, suggest that research examining youth and digital technology with a guiding interest in analyzing young people’s participation in and with the digital environment needs to combine descriptive as well as evaluative perspectives. Studying youth practices, attitudes, and behaviors is necessary to deepen our understanding of youth’s agency as they shape their increasingly digital lives. Conversely, it is important to situate these practices in a broader adult-normative context of technological design, business models, policy choices, and the like, which are also constitutive with regard to the participatory promise of digital technologies for youth.

With these perspectives in mind, this synopsis seeks to situate my research — conducted while doing my Research Fellowship at the Berkman Klein Center for Internet & Society

(cyber.harvard.edu) at Harvard University in the United States, supported by the wonderful Youth and Media team I direct — on youth and digital technology as contributions to the evolving field of youth studies in broader empirical and normative contexts that shape current and future levels of young people’s participation in an increasingly digital society. More specifically, a set of overarching questions are at the center of my research, based upon the peer-reviewed publications that form the core of this cumulative dissertation.

- **Research question 1:** Focusing on select areas of youth’s digital life, to what extent can one observe youth attitudes and behaviors that point towards enhanced youth participation in the digital ecosystem, and what factors and dynamics are at play?
- **Research question 2:** Both from a youth and adult perspective, what are the promises and challenges of enhanced youth participation, and how can a deeper understanding of relevant youth attitudes and behaviors inform decision-makers in the private and public sector to make decisions that are grounded in the realities of youth practices?
- **Research question 3:** What role can research and researchers play to work towards a more participatory digital ecosystem for youth, and what is the larger normative context both within which research on youth participation takes place and to which such research contributes?

With respect to the first research question, using a mixed-method research approach (section 2) and building upon observations from related activities and developments that have deepened my understanding of youth in the digital environment (section 3), my research identifies and discusses attitudes and behaviors that point towards increased youth participation in select areas of digital life. More specifically, my empirical research indicates a turn towards participation when studying youth attitudes and behaviors in important areas such as privacy and news, which are presented in this synopsis as two thematic examples (section 4).

In terms of the second research question, my research on youth privacy (section 4.2) illustrates how youth practices have shaped — and, at times, even challenged — traditional adult-normative notions of privacy and how youth have developed novel approaches to dealing with privacy issues. Research suggests not only how youth participation contributes to the evolution of a concept such as networked privacy, but also some of the downsides when adult decision-makers fail to take into account such practices and realities. The example of news (section 4.3) perhaps most directly shows how a complex set of technological, economic, behavioral, and other factors has led to an environment in which youth are no longer passive consumers of news, but have themselves become major contributors by creating, sharing, and reusing newsworthy content. These affordances, in turn, provide new opportunities for youth participation in their communities and society at large.

The empirical findings suggest, at least in certain areas, a trend towards increased youth participation, but also make clear that such a trend can not be taken for granted and depends on various factors and developments, including decisions made by adults around whether or not to embrace the full potential of youth engagement. In addressing the third research question, my work focuses on two such interfaces between youth behavior and adult perspectives: participatory research and the discourse about youth participation rights. My work on participatory research

methods (section 5.1) offers both a theoretical foundation and a practical illustration of how youth voices and perspectives can be incorporated into critical research areas which, in turn, can inform policy debates about the future of an increasingly digitally connected environment. An analysis of the interplay between youth and policy perspective in the context of the revision of the UN Convention on the Rights of the Child shows how insights from youth studies, together with enhanced youth participation in this discourse, has not only shaped the understanding of risks and opportunities in the digital environment, but also paves the way towards a novel interpretation of traditional youth participation rights for an increasingly digital future (section 5.2). Taken together, this research contributes to a deeper empirical understanding and identifies normative implications around ways how youth can exercise their agency and be empowered to fully take advantage of the opportunities the digital environment can offer.

A few caveats are in order. This synopsis serves as an introduction to and distillation of key themes that span across the publications that together form my dissertation. With this goal in mind, the synopsis itself does not offer a detailed literature review of all existing research on any given issue; rather, I have prioritized sharing insights from my own work. More expansive references to the relevant literature in the field are provided in the respective publications. The majority of publications at the core of the dissertation focus on research data from the United States. Where helpful and appropriate, I incorporated selected references to global studies to further illustrate my findings. Finally, youth's engagement with digital technologies is a moving target, and while the work presented in this synopsis is interested in structural shifts, it must be read as a snapshot of a rapidly changing phenomenon and an evolving field of study.

2. Methods

When studying youth's norms, attitudes, and behaviors online, one can leverage and deploy quantitative as well as qualitative methods. Quantitative methods can provide helpful raw data; however, the data may lack the ability to tell the complete story of youth's activity online. Moreover, it is extremely difficult to obtain representative quantitative data, particularly in the context of youth. There are very few entities around the world that have access to youth panels and have managed to obtain representative data (one of those entities is the Pew Research Center, which I worked with in 2013). Qualitative methods, on the other hand, can help overcome some of the shortcomings of quantitative methods. By the same token, it may be difficult to make generalizations and definitive conclusions from such data. Against this backdrop, and in the light of the goals and research questions of the project, my focus was primarily on qualitative methods (i.e., focus group interviews), but includes quantitative methods (i.e., surveys) to gather demographic data, data about access (e.g., Internet access, device ownership, basic social media usage), and, in fewer cases, issue-specific data.

My dissertation relies primarily on data from seven different studies — two of those studies I led myself and the other five studies I conducted in close collaboration with colleagues around the world. Not part of my dissertation, yet still included in this synopsis, are two currently ongoing studies that may provide an outlook in terms of the ways my thinking has evolved over the course of my doctoral work and where I would like to take my work for my post-doctoral research.

2.1 Led Studies

For the two sets of qualitative focus group interviews, I focused upon urban areas in the United States. While I was aware that random sampling would not be possible due to cost and logistical constraints, my hope was to overcome some of the non-random sampling method's lack of generalizability by sampling participants in very diverse urban areas. While my qualitative methods are not statistically generalizable to the larger population, I believe that the specific urban locations of these studies more accurately represent the American population's cultural and racial composition, compared to more racially and culturally homogenous rural areas.

Below, each study sample is explained in more detail:

Table 1
Overview of led studies.

	2011	2013
Format	Focus groups	Focus groups
Age range	12-18	11-19
Number of participants	114	203
Number of sessions	16	32
Thematic focus	1) Safety 2) Privacy 3) Creativity To study what real risks youth face online and to understand the new ecologies of online creative expression and socialization, in order to avoid overreaching policy responses that might stifle positive development.	1) Information quality 2) Privacy To understand the ways in which youth use digital technologies (such as cell phones, cameras, and video games) and online tools (such as Facebook, MySpace, Wikipedia, Google, YouTube, email, chat, forums, and blogs), and to explore youth's experiences with and opinions about them. Specifically, how youth find, use, and share information (including news) online.
Activities	A semi-structured group discussion. In some cases, a short survey was administered at the beginning.	A short survey followed by a semi-structured group discussion.
Number of surveys administered	48	203
Duration	60 minutes per session	90 minutes per session
Locations	Boston, New York	Boston, New York, Chicago, Greensboro, Los Angeles, and Santa Barbara
Languages	1 language; English	1 language; English
Number of pages of transcription	201	580

1. Study 2011

The first and smallest of the studies consisted of 16 focus groups with 114 total participants aged 12-18 based in Boston and New York. I began using the volunteer sampling method, seeking out study participants through advertisements in Greater Boston public spaces, such as libraries, bus stops, and coffee shops. These advertisements adhered to research protocols for studies involving youth, as they were addressed to adults that may know

individuals aged 12-18 interested in participation instead of being addressed directly to youth themselves. I then employed the purposive sampling method of contacting local schools and after-school programs to gauge interest in study participation among their students. After accruing sufficient interest from these schools and after-school programs, I contacted parents to see if their children would be interested in participating in the study. After conducting the first focus groups in the Greater Boston metropolitan area, I chose to carry out additional focus groups in New York due to the city's large, diverse population, recruiting another purposive sample by reaching out to its schools and after-school programs. Each focus group interview lasted for one hour. Additionally, I selected 38 participants to complete a 26-item multiple-choice questionnaire about their online behavior and social media practices.

2. Study 2013

The second and largest of the studies consisted of 32 focus groups with 203 total participants aged 11-19 across six metropolitan areas. I intended to build off the first study by expanding its scope, taking the research beyond Boston and New York to include youth perspectives from Chicago, Greensboro (North Carolina), Los Angeles, and Santa Barbara, (California). By sampling a wider selection of youth from throughout the United States — the Northeast, Southeast, Midwest, and West — I was able to aggregate more comprehensive data on youth behavior online and social media usage. This data was also more inclusive and representative than the data collected in 2011 due to the increase in total participants, as well as the number of participating Latino and African American youth. As in the first study, I identified potential participants through the purposive contacting of schools and after-school programs in each metropolitan area. After the schools and programs agreed to allow me to interview their students, I contacted parents to ask if their children might be interested in participation. Of the 32 total focus groups, 8 occurred in Boston, 4 occurred in New York, 4 occurred in Greensboro, 6 occurred in Chicago, 8 occurred in Los Angeles, and 2 occurred in Santa Barbara. Each focus group session began with a 15-minute segment in which the participants completed a 20-item multiple choice question survey and a free-response question. The survey was followed by a 75-minute semi-structured interview with each focus group. The total elapsed time for each focus group session was 90 minutes.

2.2 Co-Led Studies

In my effort to capture the global diversity of youth's lifeworlds, my work also leverages data and insights from global research studies I have co-led with colleagues from academia and international organizations. While I have been able to conduct research in the United States, it was essential for my work to engage in these studies in partnership with colleagues who have extensive knowledge about local youth culture, the relevant (Internet) language skills, and established networks and partnerships with schools, the local government, and NGOs that supported the implementation of the studies.

The research I have co-led includes focus groups and participatory workshops. Participatory workshops, especially in the context of youth, served as an ideal engagement format to address relatively complex themes (e.g., artificial intelligence, content gaps, skills) in a way that transforms such themes from abstract to engaging and meaningful. Additionally, the inclusive and open nature of participatory workshops helped to co-establish a common ground and understanding. Through the various activities, youth felt more able to relate to issues, form better understanding and sense ownership around various themes, and apply their own expertise in ways that made sense to them. Importantly, activities were designed to be playful and, therefore, accessible and non-intimidating; their generative nature allowed youth to gain a deeper and more sensitive understanding of the issues and motivated them to participate in creating solutions. Furthermore, these techniques often inspired participants to constructively contribute to the design of new products and services that benefit them.

Additionally, I have co-led — together with colleagues at the International Telecommunications Union by the UN and with guidance provided by my co-supervisor Professor Alexander Trechsel — the design, implementation, and analysis of a large-scale online survey.

	[2014] Digitally Connected	[2017] RErights.org & The State of the World's Children 2017 by UNICEF	[2018] CaS Costa Rica	[2019] Hablatam ¹	[2020] Youth Engagement Survey by the ITU
Format	Participatory workshops	Participatory workshops	Focus groups and participatory workshops	Focus groups	Survey
Lead	Amanda Third, Professorial Research Fellow, Institute for Culture and Society, University of Western Sydney	Amanda Third, Professorial Research Fellow, Institute for Culture and Society, University of Western Sydney	Lionel Brossi, Assistant Professor and Director of Postgraduate Studies, Institute of communication and Image, University of Chile	Lionel Brossi, Assistant Professor and Director of Postgraduate Studies, Institute of communication and Image, University of Chile	Doreen Bogdan, Director, Telecommunication Development Bureau, International Telecommunication Union
Data collection	July 2014 - August 2014	June 2017	November 2017 - January 2018	July 2019 - December 2020	February 2020 - April 2020
Age range	6-18	10-19	12-18	12-17	10-25 (average age of 16.9)
Number of participants	148	490	213. Costa Rica 151, Chile 22, Paraguay 19, Uruguay 21	107. Argentina 24, Chile 25, Colombia 26, Uruguay 32	1,138
Number of sessions	17	36 The average workshop size was 13; the smallest workshop had seven participants and the largest had 20.	17. Costa Rica 14, Chile 1, Paraguay 1, Uruguay 1	16. Argentina 4, Chile 4, Colombia 4, Uruguay 4	Not applicable

¹ Hablatam is a collaborative regional (Latin America-based) project that aims to address the opportunities and challenges related to young people, digital skills, and content gaps in the digital environment. The project, consisting of different modules, is led by the Institute of Communication and Image at the University of Chile and the Institute of Communication and Information at the University of the Republic (UDELAR).

	[2014] Digitally Connected	[2017] RErights.org & The State of the World's Children 2017 by UNICEF	[2018] CaS Costa Rica	[2019] Hablatam ¹	[2020] Youth Engagement Survey by the ITU
Thematic focus	Children's rights. 1) The impact of digital technologies on children's lives and connection to children's rights. 2) The opportunities for and challenges to children's rights associated with digital media.	1) Digital technologies in young people's homes. 2) Barriers to digital technologies' use. 3) Digital technologies and learning. 4) Digital technologies and their future. 5) Using digital technologies to create positive social change. Optional: 6) Risks. 7) Access to health information.	1) Digital skills. 2) Digital citizenship themes (i.e., civic and political engagement; privacy and reputation; digital economy, and artificial intelligence).	1) Digital skills — the skills young people possess, lack, and would like to acquire. 2) Content gaps — what content seems missing online. 3) Information quality — how youth search, find, evaluate, and share information.	1) How young people spend their time. 2) Issues that impact young people's lives. 3) Meaningful modes of youth engagement. 4) Ideal places to work, and dream jobs.
Activities	1) Technology timelines: children plotted their daily, weekly or monthly digital media use and connected it to their rights as a child. 2) Short vox pop interviews: children responded to a series of questions about the opportunities and challenges digital media present in enacting their rights.	Seven "missions" were shared with workshop hosts — five missions were required and two were optional. 1) Tech@home: drawing + interactions. 2) Obstacle course: drawing + ranking + discussion. 3) Education survey + discussion. 4) Speech bubbles + photos. 5) Action plan to solve a community issue.	1) A group discussion about youth perspectives and concerns about their engagement with digital technologies, within the framework of digital citizenship. 2) A participatory session with the goal to learn more about young people's perspectives on digital citizenship, artificial intelligence, and the digital economy.	A group discussion. The complete workshop methodology can be found at: [Spanish - original] https://perma.cc/R6WW-8MSM [English - machine translated] https://perma.cc/S3SY-6NDL	A survey. The complete survey methodology can be found at: https://perma.cc/R6P2-AD2A

	[2014] Digitally Connected	[2017] RErights.org & The State of the World's Children 2017 by UNICEF	[2018] CaS Costa Rica	[2019] Hablatam ¹	[2020] Youth Engagement Survey by the ITU
	3) Creative responses: children were invited to choose and explore a dimension of their rights in the digital age using one of six mediums (video, audio, photographs, drawing/painting, flip book, or written response). The complete workshop methodology can be found at: https://perma.cc/824S-QP6V	Optional: 6) Child/adult perceptions of risk + scenarios + ranking. 7) Debate + health information search. The complete workshop methodology used in this project can be found at: https://perma.cc/3VQZ-NPGY	The complete workshop methodology can be found at: [Spanish] https://perma.cc/9PY9-AQQ5		
Duration	180 minutes per session	240 minutes	240 minutes per session; divided into two sessions	90 minutes	20-25 minutes
Locations	16 countries. Argentina, Australia, Brazil, Colombia, Egypt, France, Ghana, Italy, Kenya, Malaysia, Nigeria, Philippines, Thailand, Trinidad, Tobago, Turkey, United States of America	26 countries. Bangladesh, Belarus, Bhutan, Brazil, Burundi, Central African Republic, Democratic Republic of the Congo, Fiji, Guatemala, Japan, Jordan, Kiribati, Malaysia, Nigeria, Paraguay, Peru, Portugal, Republic of Korea, Republic of Moldova, Senegal, Solomon Islands, Thailand, Timor-Leste, Tunisia, Uruguay, Vanuatu	4 countries. Costa Rica, Chile, Paraguay, Uruguay	5 countries. Argentina, Brazil, Chile, Colombia, Uruguay	58 countries. Overall, across all respondents, 60 percent were from the Americas, 24 percent were from Africa, 2 percent were from the Arab States, 2 percent were from Asia and the Pacific, and 12 percent were from Europe.

	[2014] Digitally Connected	[2017] RErights.org & The State of the World's Children 2017 by UNICEF	[2018] CaS Costa Rica	[2019] Hablatam ¹	[2020] Youth Engagement Survey by the ITU
Languages	8 languages. English, Arabic, French, Italian, Portuguese, Spanish, Malay, and Turkish	18 languages. Twelve of the 36 workshops were conducted either exclusively or primarily in English	1 language. Spanish	2 languages. Spanish, Portuguese	3 languages. English, French, and Spanish.
Number of pages of transcription	Not available	Not available	Not available	521	Not applicable
Report	Third, A., Bellerose, D., Dawkins, U., Keltie, E., & Pihl, K. (2014). <i>Children's rights in the digital age: A download from children around the world.</i> https://perma.cc/824S-QP6V	Third, A., Bellerose, D., Diniz De Oliveira, J., Lala, G., & Theakstone, G. (2017). <i>Young and online: Children's perspectives on life in the digital age (The state of the world's children 2017 companion report).</i> https://perma.cc/NRK2-UTRB	Available at: https://perma.cc/4XM8-3FN5	Available at: [Spanish - original] https://perma.cc/R6WW-8MSM [English - machine translated] https://perma.cc/S3SY-6NDL [Submitted] Brossi, L., Castillo, A. M., Cortesi, S., Lombana-Bermudez, A., Olivera, M. N., Passeron, E., Valdivia, A. (forthcoming). Youth practices and skills in a digital age: Perspectives from Argentina, Colombia, Chile and Uruguay. <i>Global Studies of Childhood</i> .	Available at: https://perma.cc/R6P2-AD2A

2.3 Ongoing Studies

As noted in the introduction of this methods section, I am currently working on two new studies. Against the backdrop of COVID-19 (i.e., with in-person meeting restrictions and the continued closure of schools and afterschool programs) and current travel restrictions, my colleagues and I have been exploring ways to shift from in-person to online consultations and engagements to learn more about young people's perspectives, practices, and attitudes related to the digital world.

3. Study 2020 and 2021

Supported by the Wikimedia Foundation and with the Hablatam team, I am currently conducting a study that examines the ways youth in Latin American find, interpret, evaluate, create, and share information online. Our hope is to learn about young people's engagement with online information related to different domains, including education, health, the future of work, and the environment. The primary aim of these consultations is to detect major shifts in attitudes, norms, and behaviors around youth's engagement with online information. I also aim to compare the collected data to my 2011 study to capture the impact of more emerging technologies (e.g., artificial intelligence) and the current pandemic. We intend to conduct five sessions, with approximately 40 youth participants in each session. Each session consists of three segments: 1) a short survey to capture demographic data and access conditions, 2) a 40-minute small group discussion (in breakout rooms), and 3) a 20 minute-segment where participants are asked questions to be answered in an open-ended format.

4. Study 2021

Under the auspices of a joint The Lancet and Financial Times Commission — Growing up in a digital world: Governing health futures — I intend to engage young people in online consultations (currently envisioned as online focus groups including polls and other more interactive activities) around the concept of “well-being.” I am approaching “well-being” in a holistic way that spans beyond mental or physical health, to include, for instance, the quality of youth's education, living conditions, social interactions, and their basic rights and opportunities to participate. Consultations will be centered around the notion of subjective well-being (i.e., life evaluation, domain evaluation, affect, eudaimonia, community), and the conceptual understanding of well-being and the role digital technologies play in it. Further, I intend to explore in what ways COVID-19 may have impacted people's subjective notion of well-being. I hope to consult a minimum of fifty young people per country. I will initially engage youth in consultations in the United States and expand the study to other regions of the world.

3. Research Context: Technologies, Social Norms and Markets, and Spheres

By way of context and across the different research themes addressed in my dissertation, three ecosystem-level developments have had a significant impact on youth participation in the digital environment with implications for those studying this research area over the past five years: 1) The increase in access opportunities driven by the availability of smartphones (vs. basic mobile phones), 2) the growth and diversification of social media platforms, and 3) the increase in skills and agency to experience digital technologies in different ways. (These developments, of course, likely also impact adult participation (Auxier, Anderson, et al., 2019)). The following sections highlight a number of data points for each of these developments, followed by a corresponding set of observations as to how and why these shifts have impacted my research.

3.1 Increased Access and the Importance of Smartphones

For most young people, smartphones (i.e., mobile phones with Internet access, typically with a microphone and a camera, capable of running downloaded applications/apps) have become the most common means of going online, affording youth a wider variety of modes of communication and more opportunities for participation (Cobo, 2020; Jael et al., 2020; Livingstone et al., 2019; Ofcom, 2019b; Rideout & Robb, 2019; Schrock, 2015; Smahel et al., 2020). This is a significant change in Internet use over the past ten years. A decade ago, youth in the United States and Europe — the two regions my work initially focused on — were most likely to first experience the Internet via desktop computer (Livingstone et al., 2019; Suter et al., 2018; Willemse et al., 2012, 2014). In 2020, by contrast, young people in Europe have ‘anywhere, anytime’ connectivity, with the majority of young people having easy access to smartphones and many of them reporting using their smartphones daily or almost all the time (Jael et al., 2020; Smahel et al., 2020). Compared to equivalent data from ten years ago, the time that youth spend online has almost doubled in many European countries (Smahel et al., 2020). In Switzerland, almost all young people have owned a mobile phone consistently since 2012 and, since 2014, a smartphone (Jael et al., 2020; Suter et al., 2018; Willemse et al., 2012, 2014). Similarly, in the United States, almost all young people — across genders, races/ethnicities, and socioeconomic backgrounds — stated in 2018 that they have access to a smartphone. This represents an increase in almost 25 percent compared to data from 2015 (M. Anderson & Jiang, 2018a).

Smartphones as access devices play also an important role outside Western countries. In the Global South, those who have access to the Internet, are more likely to access it primarily via smartphone (Brossi et al., forthcoming; Livingstone et al., 2019; Silver, Smith, et al., 2019; Silver, Vogels, et al., 2019). But ownership and access to smartphones remains lower than in the most connected parts of the world. For instance, 45 percent of young people in the Philippines, 64 percent of young people in Ghana, 69 percent of young people in Uruguay, 88 percent of young people in South Africa use a mobile phone to access the Internet (Livingstone et al., 2019). More generally, Internet access rates among youth vastly vary depending on geography. For instance, close to 90 percent of the young people (aged 15–24) currently not using the Internet live in the Global South,

specifically in Africa or Asia and the Pacific (International Telecommunication Union [ITU], 2017). Overall, this means that youth in the Global South have much less access to the Internet (Livingstone et al., 2019; Third et al., 2014, 2017; UNICEF, 2017). Furthermore, when youth have access to the Internet, they often experience both poor infrastructure and low quality connectivity, which may hinder them from fully taking advantage of the opportunities the Internet may offer (Brossi et al., forthcoming; Livingstone & Stoilova, 2018).

3.2 Platform Diversification

For those who are able to go online, the digital environment offers a range of tools youth are able to use across multiple contexts. The tools range from social media platforms like Facebook, Instagram, Twitter, and TikTok; video sites like YouTube and Netflix; messaging applications like Snapchat and WhatsApp; music-sharing sites like Spotify; online blogs like Tumblr; dating applications like Tinder, to video games like Minecraft. Since their inception, these platforms, sites, and apps have transitioned from solely a means of connecting with friends and experimenting with identity to a medium that encourages a wide array of endeavors, ranging from content production to staying up to date with the news and pop culture.

While, on a global scale, Facebook dominated the field and continues to play an important role in youth's lives, data looking at the last five years reveals that other social media platforms have grown in popularity (Brossi et al., forthcoming; M. Anderson & Jiang, 2018a; Jael et al., 2020; Lenhart, 2015; Ofcom, 2019b; Smahel et al., 2020; Willemsen et al., 2014). The reasons for the decrease in popularity of Facebook and increase in popularity of other platforms is manifold and often subjective and contextual. In my own focus groups, participants expressed "decreased enthusiasm for Facebook, citing "drama," an overabundance of mundane posts, and constraints on self-expression due to an increased adult presence" (Cortesi, 2013, p.16). Additionally, at least initially, some of the newer platforms offered alternative forms of self-expression, such as the ability to only share an image without much text or to share something with a limited time span. Today, the different platforms are in some ways more alike — most of them offer an opportunity to share images, video, and include a messaging function — and it depends on a set of variables if youth continue to use several platforms in parallel or opt for one over the other. My own research suggests that the use of specific platforms is driven by five key elements: 1) one's own, and peer group(s), preferences, 2) one's audience(s), 3) the features/affordances of certain sites, 4) one's context, and 5), one's perceived intimacy/privacy.

3.3 Skills and Agency

As digital technologies became more common and young people increasingly spent time on social media and other platforms, understanding the skills needed for youth to participate academically, socially, ethically, politically, and economically in our rapidly evolving digital environment became a topic of growing importance among youth themselves as well as decision-makers around the globe (Cortesi et al., 2020). Having a shared understanding that simply having access to digital

technologies is not enough, different stakeholders and communities have been rethinking what social and educational resources youth need access to and what meaningful opportunities to develop practical and physical, cognitive and meta-cognitive, and social and emotional skills could be made available to all youth (Brossi et al., forthcoming; Cortesi et al., 2020; Watkins et al., 2018). Furthermore, it seemed key to not only provide access and equip youth with the relevant skills, but to make sure they feel able to apply these skills and feel empowered to make decisions and take action to be able to meaningfully engage with the digital environment and to pursue their interests, passions, and goals. Consequently, schools, educators, and parents and caregivers started to incorporate some of the skills they felt were relevant for youth to be able to navigate the digital environment into their education and parenting efforts. These skills ranged from more technical skills, such as learning to type and using certain software, to learning about staying safe in the digital environment (Cortesi et al., 2020; Reich, 2020). What started primarily as a response to public concern around the possible risks young people encounter online — particularly around bullying, addiction, and online predators — later transformed into a more holistic effort to empower youth to learn the skills necessary to meaningfully engage (Brossi et al., forthcoming; Cortesi et al., 2020; Lombana-Bermudez, Cortesi, et al., 2020a; OECD, 2021; Palfrey & Gasser, 2008, 2016, 2020; Valdivia et al., 2019). Today, schools around the world are not only encouraged but required to teach these skills (Cortesi et al., 2020; Reich, 2020).

In addition to these more formal learning spaces and efforts, informal learning spaces and platforms (e.g., YouTube, Scratch, Wikipedia; maker spaces, creative teen spaces within libraries and museums, computer clubhouses) emerged, where youth could learn new knowledge from others, including peers (Lombana-Bermudez, Cortesi, et al., 2020a). A next effort then focused on how to best connect these learning spaces through the “connected learning” movement (Ito, Arum, et al., 2020; Ito et al., 2013). More recently, companies and international organizations have created their own skills initiatives and learning spaces based on their recognition of the value of young people learning these skills and the role they can and should play equipping youth with them. Some of the more prominent examples include Facebook’s Get Digital program and the Digital Literacy Library, Google’s Be Internet Awesome program, DigiComp by the European Commission, and Generation Unlimited (a global multi-sector partnership led by UNICEF, the World Bank and others, to meet the urgent need for expanded education, training, and employment opportunities for young people) (Cortesi et al., 2020; Ito, Michalchik, et al., 2020).

3.4 Relevance for My Work

Consistent with the guiding research questions, one main approach of my work has been to research young people’s attitudes and behaviors at the individual level. Conversely, how a young person interacts with digital technologies is shaped by ecosystem-level developments, as noted in the introduction to this section. The developments outlined in the preceding paragraphs have impacted my research efforts on the promise of participation in several ways.

As the first development (section 3.1) describes, smartphones have had a deep impact on how youth especially in the Global South participate in the digital environment. While smartphones

have made some forms of participation more accessible (e.g., participation “on the go,” using pictures as mode of expression, engagement through text messaging), there are other participatory activities (e.g., blogging, coding / “modding,” more sophisticated forms of content creation, editing, and sharing, many forms of online learning) that are much more difficult to accomplish on a smartphone, making it very apparent that not all youth are able to participate under the same conditions (Brossi et al., 2018; Cortesi et al., 2020; Gasser & Cortesi, 2017; Lombana-Bermudez, Cortesi, et al., 2020a; Third et al., 2017). To address this issue, much of my work — particularly as related to research questions 2 and 3 — and the work of other, has emphasized the importance of public spaces (e.g., schools, after school programs, libraries, museums, parks) where youth have access to laptop or desktop computers as well as high quality connectivity (Brossi et al., forthcoming; Cortesi et al., 2014; Ito et al., 2009; Palfrey, 2015; Palfrey & Gasser, 2016; UNICEF, 2017). Further, our research promotes youth engagement strategies and programs that consider these accessibility and affordances issues from the start, and highlight the need to co-develop specific learning materials that can be used by those who only have access to a smartphone (Cortesi & Hasse, forthcoming).

In line with the second development (section 3.2), my work has attempted to identify and understand the different platforms young people use for their participation. In this context there are three research angles that are particularly noteworthy and intriguing. One, I studied how smaller acts of participation (e.g., a like, sharing of a meme, or a comment) could be seen as a valuable engagement (Cortesi & Gasser, 2015). Two, my research helps to better understand how platforms that are traditionally seen as spaces where youth would go primarily for entertainment and fun can be leveraged for other modes of participation such as to be more civically active. Three, knowing that these platforms have become very popular among youth, I have researched how participation in informal spaces can be connected to more formal (learning) spaces (i.e., schools) in order to support interest-oriented and networked learning.

In relation to the third development (section 3.3), one area of growing concern to me in the context of participation — now somewhat at the other end of the spectrum — has been the fact that even those young people who have access to high quality Internet, devices around the clock, and social, human, and learning resources that have the potential to support capital-enhancing modes of participation, are only sometimes undertaking some of the civic, informational, and creative activities online that are described as the opportunities of the digital age (Livingstone et al., 2019; Suter et al., 2018; Waller et al., 2016; Willemse et al., 2014). These concerns are also part of the motivation behind my research agenda, so that we develop a better understanding of what decision- and policy-makers can do to positively and meaningfully design and impact pathways, so that youth are fully able to take advantage of digital technologies and feel empowered to shape and intervene in the world around them. And that we identify the prerequisites, analog and digital, and the most valuable formats and modes of engagement, so that we can support youth along the way (Lombana-Bermudez, Cortesi, et al., 2020a).

In sum, one big influencing and motivating factor behind my work has always been to study youth at an individual level, across geographies and other demographic variables, in relationship to the platforms they use and the spaces they navigate, and situated across a multitude of contexts. That being said, I am aware that this emphasis on the individual needs to be accompanied by taking into

account that youth are one of several stakeholders (e.g., friends and family, teachers, coaches and mentors, companies, governments) that impact a young person's life and that at times there is need for a switch to a more systems-level discussion and/or approach, especially in cases where we realize the limitations of relying on an individual to address an issue (e.g., protecting one's privacy in an ecosystem with strong commercial interests and entities, changing how traditional news media operates in order to better reach youth) or where the inequalities are so severe that it warrants changes at a societal and policy level (e.g., child rights debate, the ask for more participatory research) to meaningfully address them especially at scale. I hope that my individual-oriented research efforts contribute to an evidence-base for these system-level efforts and design choices (see also research question 3).

4. Youth Participation in the Context of Privacy and News

In the previous section 3, I have shared three developments (i.e., the emergence of smartphones, social media platforms, and youth skills and agency) that have had an impact on the broader research context. These developments are very relevant, when aiming to understand how the concept of participation has evolved over the past few years.

In this section, I would like to showcase how – with the emergence of digital technologies – youth participation has become quite nuanced, allowing us to rethink and adapt some of the older concepts of participation that tend to focus on more traditional forms of participation. I first intend to describe how youth participation has changed and what new opportunities have emerged. I then hope that, by way of example, the two thematic areas — privacy (section 4.2) and news (section 4.3) — I have chosen to focus on as part of my dissertation, will provide further support for my overall argument.

4.1 Participation

From learning new knowledge and skills, to engaging with friends and interest-driven communities, raising awareness about social issues that matter to them such as gender issues or "Black Lives Matter," collaborating with and mobilize others to be civically active, and cooperating on peer-based production projects, the spectrum of available opportunities for participation is quite wide (Benkler, 2006; Brossi et al., 2018; Ito et al., 2009; Jenkins, 2006; Jenkins et al., 2009, 2015; Kahne & Bowyer, 2018; Lombana-Bermudez, Cortesi, et al., 2020a; Lombana-Bermudez & Watkins, 2020). Digital technologies can allow youth to engage academically, socially, ethically, and politically in novel ways that often are based on more basic forms of participation (e.g., communicating with others, writing, sharing pictures and videos), but can now be experienced and expressed digitally through more diverse means.

While smartphones, social media platforms, and an increase in skills and agency have made participating easier for many, a large portion of young people are still not able to fully take advantage of the digital environment. In most cases, reduced opportunities for participation are shaped by a variety of access issues, including lack of access to 1) basic needs (e.g., no food, having to work), 2) technology (e.g., no connectivity, no access to devices), 3) physical and virtual participation spaces (e.g., not in a person's language, available for free, or culturally relevant), 4) human resources (e.g., teachers, mentors, and other guidance), 5) personal resources (e.g., no motivation, well-being challenges). And these access issues, in most cases, intersect with demographic variables such as location, age, gender, skill and educational level, and socioeconomic status.

Those who have access and the skills to use digital technologies, are theoretically provided with a great number of opportunities for participation across different spaces and platforms, communities, institutions, and practices. Yet, as research demonstrates, many young people tend to engage in more mundane or "entry level" activities that are usually interest-driven or friendship-

driven (e.g., visiting social media platforms, playing games online, watching videos), while much fewer participate in more civic, informational, or creative activities, often due to lack of motivation (e.g., not seeing how one's participation matters, what difference it makes, what tangible results one could accomplish), skills, and/or support (Livingstone et al., 2019; Lombana-Bermudez, Cortesi, et al., 2020a; Rideout & Robb, 2019; Watkins et al., 2018).

That being said, there are a number of more recent encouraging signs coming from research and practice. First, there are a variety of very visible acts of (offline and online) civic and political participation driven by young people, such as the global protest against climate change, gun violence, exclusion of women, and racial injustice. Data for young adults ages 18-24 shows that they were three times as likely to attend a demonstration or march for a cause they care about in 2018 than they were in 2016. Second, those who engage in creative social media use (Zhu et al., 2019) online acts of civic and political engagement online (i.e., those who followed a candidate or a campaign on social media) are much more likely to engage in offline participation (e.g., voting, volunteering, and raising money for a charitable cause) (CIRCLE, 2018; Cohen & Kahne, 2012; Xenos et al., 2014). This relationship between offline and online civic participation questions the notion of “slacktivism” (i.e., that young people's digital efforts do not constitute “real” activism and do not produce tangible effects). Yet, at a time when societies need active, engaged citizens more than ever, fewer youth than hoped, appear to show much interest in civic and political participation, unless an issue directly addresses their needs (Broom, 2016; Cho et al., 2020; Collin & Hugman, 2020; Pickard & Bessant, 2017; Wike & Cornibert, 2018; Xenos et al., 2014).

However, it is important to value and acknowledge the full spectrum of online activities, including modest/common and more informal activities, as they may promote civic and political participation later on (Kahne & Bowyer, 2018) and may foster opportunities for learning, identity formation, belonging, and individual autonomy. Additionally, what may seem as mundane participation in isolation, such as texting, sharing a video on TikTok, or a like on Instagram, could, over time and in sum, also have a societal impact (e.g., movements around body positivity, gender identities, and climate change). Taking these elements into consideration, it is crucial to move beyond an adult-normative view of what forms of participation are valuable and a focus on individual participation efforts, and instead adopt a broader and more nuanced frame of participation.

Over the course of the next two sections, I would like to showcase — embracing this broader and more nuanced conceptualization of participation — how youth participation looks like in the contexts of privacy and news. Further, I hope that both thematic examples can convey, both from a youth and adult perspective, the promises and challenges of enhanced youth participation, and how a deeper understanding of relevant youth attitudes and behaviors may better enable decision-makers to make decisions that are grounded in the realities of youth practices. Each thematic example begins with a brief introduction (more detailed information can be found across publications part of my dissertation), followed by key differences in youth and adult perspectives and key opportunities and challenges in the context of participation, and ends with my own conclusion where I see the participatory promise based on my own research and the one of others.

4.2 Participation in the Context of Privacy

4.2.1 Introduction

As highlighted previously (section 3.2), a vast range of tools (e.g., social media platforms, messaging apps, music-sharing sites, online blogs, apps, video games) continue to play an increasing role in the lives of young people due to advancements in technology and the increasing number of options available. Across platforms, apps, and spaces, youth share a vast amount of information about themselves. And it's not just youth sharing information about themselves online — their friends, families, schools, and others are contributing to the information available about a young person online (Donovan, 2020; Palfrey & Gasser, 2016; Plunkett, 2019; Plunkett et al., 2019). By the time a young person transitions into adulthood, there are thousands of data points related to the young person available online (Palfrey & Gasser, 2016). And while this presents a challenge, for many youth, engaging with the digital environment is considered essential as not engaging would mean missing out on opportunities to cultivate one's social, cultural, and economic capital and improve one's socioeconomic status (boyd, 2007; Lombana-Bermudez, Cortesi, et al., 2020a, 2020b).

Despite the presence of social media, apps, and other spaces in young people's lives and the wide range of information sharing, youth are becoming increasingly aware of their data traces and the extensive data collection and analysis by companies and other institutions in a post-Cambridge Analytica world (Madden, Lenhart, Cortesi, Gasser, et al., 2013; Palfrey & Gasser, 2016; Stoilova, Livingstone, et al., 2019). This previously unknown privacy implication further complicates the technology landscape as it extends beyond what youth choose to explicitly share online. In the wake of this newfound awareness, privacy-centric regulations such as the General Data Protection Regulation (GDPR) and the Children's Online Privacy Protection Act (COPPA) are aimed at affording young people additional privacy protections by, for instance, implementing consent ages for their use of social media platforms and companies' abilities to collect, process, and store their data (boyd et al., 2011; Donovan, 2020; Information Commissioner's Office, 2018; Livingstone et al., 2018; Montgomery & Chester, 2015; Palfrey & Gasser, 2016; Plunkett et al., 2019; Smahel et al., 2020; Topelson Ritvo, 2016; Topelson Ritvo et al., 2013; Van Der Hof, 2017). However, due to the novelty of these topics, many questions still remain unanswered with respect to deciding an appropriate consent age, how companies should (more from an ethical perspective) treat young people's data differently, how to verify a young person's age online, and even how to update the consent form once the child is old enough to consent (Livingstone, 2018; Livingstone et al., 2018; Pasquale et al., 2020; Plunkett et al., 2019; Smahel et al., 2020; Van Der Hof, 2017).

Given these questions and the amount of information youth share through these platforms, it is important to study how young people think about privacy, with respect to both explicit information sharing and implicit data collection, processing, and storing, and what steps they are taking to maintain their privacy. Further, gaining an understanding about how their digital interactions may affect their futures will help identify areas where youth can improve their privacy management skills and where an individualistic approach may reach its limits and others may have to step up.

4.2.2 Conceptualizing Privacy

Contrary to popular assumption, my own research and that of others suggests that even though youth are willing to disclose large amounts of information, they do care about, contemplate, and manage their privacy online (Madden, Lenhart, Cortesi, Gasser, et al., 2013; Palfrey & Gasser, 2016, 2020; Plunkett et al., 2019). However, their understanding of privacy and what it means differs from that of adults. Rather than conceiving of privacy as a matter of institutional challenges involving strangers and third parties, young people often view the concept as more of a social concern (“What can my friends and family see?”) and manage their privacy in relation to people they know. This “interpersonal” aspect of privacy focuses on who to explicitly share information with (and who to hide it from) and dominates youth understanding about privacy (Livingstone & Stoilova, 2018; Madden, Lenhart, Cortesi, Gasser, et al., 2013; Palfrey & Gasser, 2016; Stoilova, Livingstone, et al., 2019).

Acknowledging that youth conceptualize privacy differently than adults does not diminish adult concerns, which are valid (Auxier, Rainie, et al., 2019; Stoilova, Livingstone, et al., 2019). Today, digital information about youth is collected, stored, and searched for at an unprecedented rate. Neither youth nor their caregivers have much control over how this information is handled by third parties, as data is frequently gathered, accessed, disclosed, copied, and sold without consent or knowledge (Feldstein, 2020; Hartung, 2020; Lombana-Bermudez, 2020; Montgomery et al., 2020). Meanwhile, what is known about a young person has an increasingly large sway over the person’s future social, academic, and professional prospects. While my own research highlights that youth often feel confident in terms of their own sharing of information to ensure that certain information does not reach admissions officers and grandparents, they continue to have little jurisdiction over what the platform itself undertakes with the information disclosed and how that may shape long-term online and offline activities. And those youth who are aware of the data collection often believe that it is an unavoidable side-effect of online participation (Madden, Lenhart, Cortesi, Gasser, et al., 2013; Palfrey & Gasser, 2016; Stoilova, Livingstone, et al., 2019). They mostly trust institutions such as schools or hospitals with their information and believe that companies should act morally with their information, forming the stance that personal data is “none of their business” (Cortesi et al., 2014; Stoilova, Livingstone, et al., 2019). However, as youth learn more about privacy and their concerns increase, they tend to become more skeptical about commercial entities (Livingstone et al., 2018; Stoilova, Livingstone, et al., 2019; Zarouali et al., 2017).

4.2.3 Managing Privacy

Research suggests that privacy management often takes the form of deciding what to post and what not to post, or how much to reveal to whom, precisely because young people are aware of the openness and permanence of online information sharing. Findings suggest that there are a myriad of strategies and techniques in terms of how youth actively manage information and audiences (Davis & James, 2013; Gardner & Davis, 2013; Madden, Lenhart, Cortesi, Gasser, et al., 2013; Stoilova, Livingstone, et al., 2019). However, their approaches (or lack thereof) suggest that they tend to view social media platforms by default as public and private by effort (boyd, 2010; Palfrey & Gasser, 2016). In search for more privacy, while many young people still have a Facebook account, there has been a shift away from “public” platforms towards private messaging applications such as Whatsapp and Snapchat (Ibañez & Palenzuela, 2019, 2019; Jael et al., 2020;

Livingstone et al., 2019; Willemsen et al., 2014), which provides youth with a greater sense of security in limiting who can see their personal conversations (Byrne & Burton, 2017; Jael et al., 2020). Research shows that youth consider it important to curate their profile on a particular platform towards its intended purpose — LinkedIn is perceived as a “professional” platform while Instagram is perceived as “artsy” (Kanchinadam et al., 2018; Porter, 2018). Some young people even create multiple accounts under the same platform for different content and targeted audiences (Kanchinadam et al., 2018; Stoilova, Livingstone, et al., 2019). For example, they may have a public facing “real” Instagram account with a larger audience and a secondary account, better known as a “finsta,” that they only share with their close friends (Kanchinadam et al., 2018). Studies, including my own, show that youth privacy techniques also include blocking users, changing passwords, and even using fake names (Livingstone et al., 2018; Madden, Lenhart, Cortesi, Gasser, et al., 2013; Smahel et al., 2020; Stoilova, Livingstone, et al., 2019). Youth tend to believe that they should not share everything about their lives while still cultivating an online presence. The techniques used by young people are mostly related to information they explicitly share rather than to data collected by companies (Stoilova, Livingstone, et al., 2019).

When it comes to their online activity, youth are willing to learn from their mistakes and correct themselves retroactively (Stoilova et al., 2019). Studies show that some young people, although not a majority, will consult adults when they feel their privacy has been breached (Palfrey & Gasser, 2016; Smahel et al., 2020; Stoilova, Livingstone, et al., 2019). Where youth privacy strategy is lacking, however, is when it comes to proactive techniques especially as it relates to data collection. Studies show that while youth are aware that they can change their privacy settings, they rarely do so (Livingstone & Stoilova, 2018; Smahel et al., 2020). There is currently little research on the extent to which young people use other proactive privacy methods, such as privacy managers or ad-blockers, to protect themselves against data collection.

4.2.4 Blind Spots

While young people implement a number of privacy practices online, they cannot help but leave an unprecedented amount of data behind. Friends and family tend to enlarge the issue as often they may add additional data (e.g., pictures and videos, mentions, connections) to the existing data set shared by a young person (Palfrey & Gasser, 2016; Plunkett, 2019). Companies, governments, schools, and other institutions collect, store, and in many cases own this data (Haduong et al., 2015; Livingstone et al., 2018; Palfrey & Gasser, 2016; Plunkett et al., 2019; Raftree et al., 2020). As a result, young people are left with little control over the data they are leaving behind and neither the law nor technological advancements have been of much help to young people so far in this regard (Palfrey & Gasser, 2016). There currently is a lack of research about the consequences of such a digital footprint, but research suggests how one’s footprint may have short- and long-term effects (OECD, 2021). A digital footprint enables personalized ads, targeted content, ID theft, location tracking on a global scale, or could even lead to college admission revocations (Jaschik, 2019; OECD, 2021; Palfrey & Gasser, 2016).

As technologies become even more embedded in the day-to-day lives of youth — through mobile technology, wearables, connected toys, and other emerging technologies — an increased amount of data is collected, stored, and used through their online activity (Altman et al., 2018; Barrett, 2020; Future of Privacy Forum & Family Online Safety Institute, 2016; Hartung, 2020; Hasse et

al., 2019; UNICEF, 2020). This increased input enables artificial intelligence (AI) based technologies to more easily (and more accurately) make predictions about youth that may affect their future employment opportunities, healthcare, education and finances (Brossi et al., 2019; Byrne & Burton, 2017; Castillo & Brossi, 2020; Hasse et al., 2019; Montgomery et al., 2017; OECD, 2021; UNESCO, 2019a, 2019b; UNICEF, 2018, 2019, 2020; WEF, 2019). While my research shows that youth tend to be careful about what they share explicitly to particular audiences, others have demonstrated how it can be possible to re-identify a person through fragments of their data, meaning that information which youth thought was private is not necessarily private (Palfrey & Gasser, 2016). What makes predictive artificial intelligence an even challenging topic is that although there are privacy risks, there are also potential benefits. Specifically in education, artificial intelligence could increase opportunities for feedback and can individualize education to a child's specific needs, but conversely could also create inequality in the resources that are offered and decrease creativity by limiting the choices students can make (Cardinal-Bradette et al., 2019; Hasse et al., 2019; UNICEF, 2019, 2020). Similarly, an example of artificial intelligence in healthcare shows a promising technology for detecting malnutrition in children using just their photo which could increase accuracy, be less invasive, and reduce costs (Kimetrica, 2019), but at the risk of potential profiling, tracking, or suppressing of children (UNICEF, 2020). Much is still unknown and more research is needed to determine the AI-related areas where young people could benefit from additional awareness and improved privacy practices.

In addition to predictive AI, companies can create robust marketing profiles and target young people who are known to be a more susceptible age group. Studies show that youth do not feel like they overspend online or like they are cheated through in-app purchases (Smahel et al., 2020), but companies have the capability of employing persuasive techniques such as targeting young people when they are near a purchase point or even through use of color-coordinated buttons in apps (Cobo, 2020; Hartung, 2020; Montgomery et al., 2017; Vivrekar, 2018). Because youth can often operate online “invisibly”, meaning it is difficult to verify they are not adults, they may interact with adult content in ways that would not be permissible offline (Livingstone, 2020). Youth can be targeted by misinformation campaigns (Hillman et al., 2020; OECD, 2021; Smahel et al., 2020), and although misinformation campaigns are certainly not limited to youth, some studies suggest that targeted campaigns decrease youth's capacity to make decisions for themselves or understand multiple viewpoints (Alias, 2018; boyd, 2018; Walsh, 2019; Williams, 2019). Clearly there is a potential for a long-term effect of predictive technology and targeted campaigns as it relates to a susceptible youth age group, but there is still much to learn.

Even when young people are careful with what they share and who they share it with, artificial intelligence and other advanced technologies can make assumptions about them without their input, meaning that their online identity is no longer decided by them alone. It is difficult to stop companies from sharing data with third parties, to know how much information companies have collected and even harder to correct for inaccurate assumptions they make, meaning that young people are not in complete control (Palfrey & Gasser, 2016). Thus, it is more important than ever for youth to be educated about the privacy tradeoffs of a digital lifestyle, especially for these implications that are not so obvious.

4.2.5 The Participatory Promise Based on “Privacy” Research

The key findings illustrated in the previous sections highlight the importance of youth participation in a number of ways. First, a growing body of interdisciplinary research, including my own contributions, demonstrates how research with direct youth involvement (i.e., participatory research; see section 5.1) can help us to better understand how traditional and more binary notions of privacy (simple notions of control) are changing as digital technologies, business models, and user behavior evolve in the networked environment. In many ways, given their intensive and at times also experimental use of technology, youth are at the forefront of these changes and drive the evolution of new notions of privacy. As decision-makers in the public and private sectors are tasked (and face pressure) to identify, analyze, evaluate these challenges to set the stage for sound policy-making, youth involvement can inform the decision-making process and ensure that adult conceptual models are grounded in the lived experiences of those who use digital technologies the most.

Second, youth involvement in privacy decisions-making is also necessary to ensure that interventions in response to the identified shifts focus on the right problems, including issues related to unexpected uses of digital technologies often pioneered by young people, and prescribe the appropriate remedies. Consider the example of the determination of an appropriate consent age for using online platforms. Traditionally, consent has been tied to one’s capacity to make decisions for themselves and allowing youth to participate in these decisions and have freedoms has been known to increase their opportunities both offline and online (Van Der Hof, 2017). When youth do not have the capacity to consent it is usually left to an authority to make the decision because of their knowledge about the topic, but what makes the online case particularly interesting is that parents, for instance, are not necessarily more knowledgeable about online privacy than young people (Hartung, 2020; Livingstone, 2018; Van Der Hof, 2017). Young people are one of the largest user groups of digital technologies and are known to experiment digitally, making their knowledge valuable (5Rights, 2019; Livingstone, 2018). Further, studies show that many adults do not actually read the terms and conditions or privacy notices for different online services (Van Der Hof, 2017), meaning that adults may not be better educated than their children about online privacy (Palfrey & Gasser, 2016). Thus, it may be beneficial to young people to make decisions about their online access without them. Additionally, laws such as COPPA have confused parents and youth into thinking that consent age functions as a warning about safety, like a PG-13-rated movie, rather than to protect them against privacy infringement, which has often led to parents’ complicity in children lying about their ages (boyd et al., 2011). In contrast, the design of youth-specific policy informed by and enabled through increased youth participation has shown promise to make the online environment a safer place for young people. If decision-making is left to lawmakers, without youth involvement, research shows that well-intended laws might be ineffective because they are out of sync with youth behavior and attitudes (boyd et al., 2010). Research shows that policy measures that are not sufficiently taking into account the behavioral realities of young people they seek to protect might remain ineffective or, at worst, can backfire (Palfrey & Gasser, 2016).

Inclusion of youth in privacy discourse and decision-making is also appropriate and necessary from a normative perspective. From an ethical perspective, it is important that young people have at least some degrees of agency in the digital environment, which is often recognized in the

commercial and transactional context, for instance as subjects to data-tracking and similar advanced models, but should also be acknowledged when it comes to “writing the rules” that seek to govern the privacy of the online spaces in which youth spend much of their digitally connected lives. Some commentators argue that youth in fact have a right to participation in shaping future policies that in turn will have a deep impact on their future developmental, educational, economic and broader societal opportunities. In the legal and policy arena, and mostly concerning issues related to the offline environment, child rights have evolved to allow for youth participation and development, in addition to policies purely aimed at child protection (Hartung, 2020; Livingstone & Stoilova, 2018; UNICEF, 2020). Both from a conceptual and normative perspective, these principles of youth participation and engagement need to extend to online issues and practices as well. With respect to privacy regulation in particular, youth are important stakeholders given that children are targeted through surveillance and “monetized” online (Livingstone, 2018; Livingstone & Stoilova, 2018).

4.3 Participation in the Context of News

4.3.1 Introduction

As technologies have shifted from analog to digital, so has the information ecosystem and people’s engagement with it. Today, on average and particularly when compared to older generations, many young people are engaging less with traditional analog information mediums (e.g., radio, TV, newspapers) but instead are making the digital environment (e.g., social media platforms, news website/app) their medium of choice (Cortesi & Gasser, 2015; Davison et al., 2020; Livingstone et al., 2019; Mitchel et al., 2020; Rideout & Robb, 2019; Rideout & Watkins, 2018; Robb, 2020; Smahel et al., 2020; Suter et al., 2018; Wyss, 2020). From accessing information about local communities or about politics, checking the weather, following celebrities, receiving the latest updates from the gaming world, or watching informative videos on YouTube and TikTok, data from the United States highlights the importance of digital technologies for young people’s consumption of information across contexts, such as education, leisure and entertainment (Auxier & Anderson, 2020; Livingstone, Kardefelt-Winther, & Saeed, 2019; Rideout & Robb, 2019; Rideout & Watkins, 2018; Suter et al., 2018). The transition to personal smartphones and the emergence of social media platforms have given young people a greater choice about when and how they want to access information (Ofcom, 2019b). Both developments have also enabled young people to become information creators rather than just passive consumers (Gasser et al., 2012).

While some evidence suggests that youth do not report high levels of media creation (Brossi et al., forthcoming; Livingstone, Kardefelt-Winther, & Saeed, 2019; Rideout & Robb, 2019; Robb, 2020) and that the act of the repurposing or distributing existing information as a form of media creation (Milner, 2016), others say that the act of choosing, commenting, reviewing, and sharing information with friends is a participatory act (Jenkins et al., 2015). When youth today engage in media creation, it’s often less like pre-existing common forms (i.e., amateur filmmakers or citizen journalists creating nonprofessional versions of long-standing media genres and formats), but instead gets expressed through new modes such as a meme or GIF over WhatsApp, a story on

Instagram, a photo or video over Snapchat, or a short video clip on TikTok. According to more recent evidence, these new modes of expression and participation on social media, even if perceived as less significant, can make it more likely for a young person to then (politically) participate (Zhu et al., 2019).

The news media industry has also changed in the context of evolving digital technologies, the emergence of new spaces and mediums for news, and shifts in youth behavior. Traditional news media — television, radio, newspapers — still remain available as offline outlets, but, in most cases, have branched into the digital environment, making their content more accessible to many more people. In parallel, less traditional outlets emerged online and social media platforms started to extensively feature information about current events. This has enabled young people to experience information about what is going on around them in a variety of formats, including text, video, audio, and multimodal, and in diverse genres, such as fanfiction and memes. These formats and genres are particularly well suited for social media platforms, one of the reasons why the formats and genres became so popular among young people and beyond.

4.3.2 Conceptualizing News

As researchers seek to better understand the changing behaviors and attitudes of today's young information consumers and creators, it has become increasingly important to better understand how young people conceptualize “news,” how that definition continues to evolve, and how it connects to youth participation and civic engagement (Cortesi & Gasser, 2015; Madden et al., 2017; Malik et al., 2013). My own research and that of others in the field suggests that what “counts” as news for a young person is becoming multifaceted, likely varies from person to person, depends on the language one speaks, can elicit a wide array of positive and negative reactions, and is reflective of the complex and transforming media environment in which youth live (Cortesi & Gasser, 2015). When asked to articulate what news means to them, youth offer a nuanced set of practices, understandings, and opinions. Rather than perceiving news as a singular type of information, youth describe news in a variety of ways (Cortesi & Gasser, 2015; Madden et al., 2017).

Some youth conceptualize news as something narrow, deeply related to politics or current events. Essentially, this is the information that tends to be reported by traditional news media (Cortesi & Gasser, 2015). Those (i.e., parents, teachers, traditional news publishers, and scholars) who apply this narrow concept to their thinking or work tend to state that youth are not interested in news — neither in its consumption nor creation (fög, 2018; Livingstone et al., 2019; Robb, 2020; Smahel et al., 2020; Suter et al., 2018). In some of the nationally representative studies conducted in languages other than English, the disinterest of young people may be linked back to the language that the study was conducted in. In some of these studies, when youth were asked about their engagement with news, “news” was translated into “newspapers” or “newspaper or magazine platforms” (Smahel et al., 2020; Suter et al., 2018). In the United States, the most recent nationally representative study confirms youth's disinterest (Robb, 2020). However, findings from the same study indicate that the surveyed youth were thinking of news in a narrower sense. For example, a vast majority, when asked about what issues they would like to see featured less in the news, said “politics” (Robb, 2020).

Other youth described news in much broader terms, as “referring to anything from breaking news about current events, to celebrity gossip, updates about games, sports scores, and learning about a friend’s new relationship” (Cortesi et al., 2013; Cortesi & Gasser, 2015, p. 1429). This broader framing is in part due to some of the features and affordances of social media. For instance, some of the social media platforms commonly refer to their stream of posts as a “news feed” (Facebook) or “feed” (Twitter, Instagram), suggesting to young users that “news” constitutes the content their friends and other connections (e.g., celebrities, companies, NGOs) share (Cortesi & Gasser, 2015). Following this broader definition, my own research clearly demonstrates that youth are interested in “news,” but have a different understanding of scope, relevance, and quality (Cortesi & Gasser, 2015). Consistently, across the globe, evidence suggests that the majority of young people think that news is something important to know and relevant to one’s life (Cortesi et al., 2013; Cortesi & Gasser, 2015; Madden et al., 2017; Robb, 2020).

4.3.3 Managing Feelings Toward News

If, through conversations with youth, one explores the reason why young people increasingly do not inform themselves through traditional news media, the key words “understandability” and “relevance” repeatedly appear. In essence, youth want to consume news that they understand and that is relevant to them. This feeling was captured in a recent study where youth reported that traditional news is not about issues young people truly care about or address concerns that significantly matter to their lives (Robb, 2020). A second prominent feeling youth have towards news is that they believe much of the news they consume is biased, favoring men, white people, and adults (Madden et al., 2017; Robb, 2020). My own research, focused on Switzerland, confirmed some of these findings. With the help of Media Cloud, an open source, open data platform that allows researchers to answer complex quantitative and qualitative questions about the content of online media created by the Berkman Klein Center and the Center for Civic Media at MIT, I conducted, with my colleague Patrik Mueller, an analysis of the seven largest newspapers in Switzerland. Although we never published the analysis, the data showed that these seven newspapers reported mostly about youth in the context of schools, the police, or parents. Thus, there were very few examples where young people were featured in a news story because of something exciting or innovative they had done. In addition to youth perceiving news as biased, the vast majority of young people say that news (in the narrower sense) is usually depressing and frustrating (Madden et al., 2017; Robb, 2020). One may argue that this perception may be an accurate representation of the current world around us and that these feelings and emotions are something youth will have to learn how to navigate.

These rather negative feelings may offer some indication as to why young people are looking for different news content — news possibly generated by friends, people in one’s community, or other users online — that, in an ideal scenario, empowers youth to make a difference in their communities (Robb, 2020). There are a number of emerging initiatives (e.g., solution journalism, constructive journalism) that hope to address these feelings at the content level. Another path forward could focus on different forms of engagement throughout the information lifecycle rather than just matters of content. Traditionally, the literature has primarily examined how youth engage with news once they have it in front of them (i.e., how they evaluate it, how they assess its credibility, how they determine its accuracy etc.). However, my research clearly shows that while it is important to understand how young people engage with news once it is in front of them, it is

increasingly important to understand how they obtained the news (e.g., did they arrive at it by using a search engine?, did they search for it using a voice assistant?, was the information accessed via a specific app?) and what actions they take after consuming it (e.g., resharing, liking, commenting on, remixing it).

4.3.4 Blind Spots

The social media ecosystem is not a monolith. Platforms vary in a range of ways, including design, content shared, and intended audience. Undoubtedly, social media today is playing a key (if not “the”) key role in determining the pathway through which youth get their news and what kind of news they are getting (Madden et al., 2017; Mitchel et al., 2020). And while researchers have not reached a consensus on whether the use and structure of social media leads to a better and/or more or less diverse news engagement, there are a number of issues and possible blind spots worth further exploration (Cortesi & Gasser, 2015).

First (re. content diversity), my own research suggests that youth learn from multiple news sources and various formats about current events, including news related to politics (Cortesi & Gasser, 2015). And when youth are asked about how well of an understanding they have about what’s going on in the world, a majority of youth say that they have a good understanding (Robb, 2020). However, evidence from a recent nationally representative study with young adults (ages 18-29) in the United States suggests that those who rely mainly on social media (vs. sources such as newspapers, radio, TV or news websites) to get their news, are less knowledgeable about current major political events (i.e., the COVID-19 pandemic and the 2020 presidential elections) (Mitchel et al., 2020). For example, only about four in ten of these respondents provided the correct answers to a set of fact-based questions about topics ranging from Donald Trump’s impeachment to COVID-19 (Mitchel et al., 2020). Thus, it continues to be essential to research the transition from traditional information gatekeepers towards powerful algorithms, as well as the relevance of peer recommendations.

Second (re. source diversity), while my own research suggests that youth access news through a broad range of sources, algorithms and personalization on social media heavily impacts young people’s news sources (Cortesi & Gasser, 2015). Some scholars argue that young people tend to get their news primarily from like-minded people a young user has chosen as “friends,” which may lead to exposure to more ideologically uniform information (Cortesi & Gasser, 2015; Kossinets & Watts, 2009; McPherson et al., 2001; Zuckerman, 2013). However, these “friends” are typically famous personalities, influencers, and celebrities (Robb, 2020). It remains to be studied to what extent these personalities are truly like-minded or not. In Robb’s (2020) study, the 804 teens surveyed mentioned 731 different personalities they rely on for their news. The most commonly named personalities were PewDiePie, CNN, Trevor Noah, Donald Trump, and Beyonce (Robb, 2020). In a similar vein, Reuters’ *Digital News Report 2020*, which surveyed individuals ages 18 and up in six countries, found that large numbers of the respondents ages 18-24 obtain their news about COVID-19 from social media, where “celebrities and influencers play an outsized role . . . with some sharing music, running exercise classes as well as commenting on the wider health issues” (Newman et al., 2020, p. 14). For example, nearly half of respondents in Germany (38 percent) and Argentina (49 percent) use Instagram as a key source to learn about the global pandemic (Newman et al., 2020).

Third, not only is the diversity of news a topic of concern to many scholars, but, in recent years, the quality (e.g., accuracy, how factual the information is, credibility) has become a major topic of study under umbrella terms such as “fake news,” misinformation, or disinformation. Recent data from young adults (ages 18-29) in the United States suggests that those people who engage mostly through social media with news are much more likely to come across misinformation (Mitchel et al., 2020). For instance, when participants were asked in March if they had seen information about COVID-19, those respondents who obtain their political news via social media were the most likely group (57 percent) to indicate they had come across misinformation, compared to 49 percent or less among those groups who primarily receive news from other platforms (e.g., TV, radio, print). And likely, in the coming years, due to more technological advancement, mis- and disinformation will have an even more prominent role online by shaping not only the content young people read, see, and listen to (e.g., fake videos and audio; in the future, potentially fake fact-checking sites), but also who they interact or think they are interacting with (e.g., bots on social media and messaging apps).

However, research suggests that youth are somewhat aware of these three issues. Research conducted by Madden et al. (2017) highlights that some youth are cognizant of the lack of diversity in perspectives and the bias that can result from the automated selection of news and that they assume a great deal of personal responsibility for actively seeking out opposing viewpoints and educating themselves from a range of perspectives (Madden et al., 2017). Other recent evidence states that more than half of teens (ages 13-18) in the United States are aware that fake news exists and say that they know how to “tell fake news stories from real news stories” (Robb, 2020, p. 21). Additionally, a survey of 12-15-year-olds in the U.K. indicated that the vast majority (78 percent) had heard of fake news, and 60 percent of these youth would undertake some type of action (e.g., telling their parents/caregivers or other family) if they came across a fake news story online (Ofcom, 2019a).

Even if youth are thoughtful when it comes to their news engagement and their perceptions of it, due to the transition towards powerful algorithms and social media, the evidence suggests that young peoples’ news experience depends on many more variables that are not controllable by youth alone. The path forward will likely require a multifaceted approach. We need to create engaging opportunities for young people to continue to explore diverse news and help them make better sense of this complex news ecosystem. We should also further examine what learning opportunities and spaces exist where youth can gain relevant skills. And we have to design and build new technological advancements that help positively shape the news ecosystem. But ultimately, in order to address issues like biased news or misinformation, the adult world (ideally through a co-design approach²) will have to work on the underlying structural and systemic issues at play.

4.3.5 The Participatory Promise Based on “News” Research

Findings from research that focuses on youth behaviors and attitudes and takes serious youth perspectives in the context of news points towards a number of analytically distinct, yet interrelated

² Co-design is a collaborative and creative approach that brings together youth with experts (e.g., staff, faculty) to co-create content and learn from and with each other.

observations regarding youth participation. Similar to the dynamics observed in the privacy example, youth practices concerning information that is important to know and relevant to their lives in an increasingly digital (media) ecosystem point towards a possible shift in and a broadening of the conceptualization of “news” when compared to traditional adult-normative definitions. While it remains an open question whether youth’s perspectives point towards a longer-term change in our understanding of news across populations, research on young people’s interaction with news-relevant information offer a set of interesting insights how the changes from an analog to a digital information ecosystem and the rise of social media might lead to a blurring between traditionally clearly delineated content categories on the one hand and previously more clearly separated roles of news consumption and news production on the other hand.

Participatory research (section 5.1; Cortesi & Hasse, forthcoming) aimed at deepening our understanding of youth’s interaction with digital technologies can also serve as a sensory or seismographic system to identify and prioritize areas of concern from an educational and, ultimately, societal perspective. Understanding and analyzing youth’s interaction with “news” along a lifecycle of information behavior, for instance, can point towards currently unchallenged assumptions when it comes to current approaches on how to deal with mis- and disinformation issues on social media, for instance through facts-checking or content-flagging. A youth-informed information quality approach not only draws attention to the powerful role that social media platforms and their algorithms, but also seeks to take into account how often less visible peer-to-peer relations and the sharing of information over non-traditional news channels (including text messaging apps) may challenge traditional notions of and safeguards for content quality or exposure diversity. As in the privacy example, these types of perspectives and insights derived from participatory youth research summarized above can inform decision makers when considering the design of future policy interventions — and anticipate their effectiveness — aimed at preserving a high quality information ecosystem, including “news.”

The findings from the previous sections can also set the stage to bolster young people’s engagement with “news.” Knowing that youth may have a broader concept of news, that social media plays an important role, and that it is essential to consider the entire information lifecycle can help journalists and other content producers, media and tech companies, as well as educators to design better strategies and approaches for youth engagement and participation. For instance, understanding the nuances of the concept “news” from a youth angle and in a social media context can encourage those interested in sharing relevant information on current events with young people to more strategically tailor the information to youth interests and information needs. Furthermore, taking the whole information lifecycle of youth’s interaction with “news” into account provides additional points of engagement along the cycle (e.g., re-use and sharing of content in form of memes), more spaces and platforms that can be leveraged where youth are already active participants (e.g., social media, gaming platforms, learning platforms), and more nuanced and diverse opportunities (e.g., tools, features, formats) to enable and support participation.

5. Embracing the Promise of Youth Participation

In the previous sections 4.2 and 4.3, I have highlighted findings from research in select areas of youth's digital lives that suggest the promise of increased youth participation facilitated by digital technologies. My work examines the trend towards increased youth participation at both an empirical and conceptual level and points towards a broader set of normative promises that are associated with such shifts. The work also makes clear, however, that the realization of the promise of enhanced youth participation should not be taken for granted and depends on various factors and developments. In this section 5, I would like to highlight two areas of work to which I have contributed, that illustrate different ways in which adult decision-makers can unlock and support a participatory youth environment.

Section 5.1 focuses on youth participation models in research settings and summarizes some of the key methodological conclusions from working with youth. The contributions and observations in this thematic context are both conceptual as well as practical and build upon research methods I pioneered. The participatory approach and practices discussed in this thematic context span across the entire "lifecycle of research" and, for instance, include experiences of how youth participation can help researchers to identify and better articulate research questions concerning digital lives, as well as methods to contextualize and translate the findings from research such as focus groups or surveys.

Section 5.2 approaches the question of increased youth participation from a normative perspective. Building and expanding upon the examples presented in section 4, it summarizes the ways in which participatory research has aimed to inform decision-makers around the globe when addressing the risks associated with youth's online interactions, and how the policy-landscape in turn has evolved from a strong focus on risks towards the acknowledgment and support of the opportunities afforded by digital technologies. The evolving discourse about children's rights in the digital age illustrates not only how participation rights need to be re-interpreted in the light of the new technological affordances. It also provides an example of a policy-making process that includes youth consultations and other mechanisms to incorporate youth perspectives and voices to inform the debate. The current debates about appropriate policies and governance schemes for artificial intelligence, including the question of youth rights, can build upon this foundation, both substantively and in terms of participatory process design.

Taken together, these two complementary application areas — one analytical (participatory youth research) and the other normative (child rights discourse) — offer a series of insights that amplify both the relevance of youth participation in areas of traditional adult-centric decision-making, such as rights discourse and academic research, as well as the importance of studying the methods and practices of youth participation themselves.

5.1 Participatory Research

5.1.1 Starting Point: Research Driven by Adults

When I started to study young people and their engagement with digital technologies in 2009, there were already a good number of well-established researchers and research teams focusing on the topic. The common denominators seemed to be a shared understanding of the importance that digital technologies have started to play in young people's lives and an intellectual curiosity for youth attitudes, norms and behaviors. Where the daily work often differed was in terms of approaches. One strong differentiator was thematically. Some focused primarily on risks, others more on the opportunities, and yet others took a more balanced approach. Other differentiators were along the motivations (i.e., the aims of the research), the audiences it was attempting to reach (e.g., educators, parents, youth themselves, policy-makers), or the main outputs that were created (e.g., more academic papers or more translational research). Yet, the biggest differentiator was (and still is) the perspective taken and the interest in exploring and incorporating different perspectives.

My work has always been heavily influenced and inspired by my Youth and Media mentors John Palfrey and Urs Gasser and thus the work always lived “in the in betweens” rather than the poles. I came to question, how I could differentiate the work I do from what already existed and conceptualize and refine the frameworks and methodologies I use for greater impact. And while, over the course of my research, I have applied a number of different practices, one key aspiration remained the same. Namely, to not only center my efforts and do research “about” or “for” young people but, more importantly, “with” young people — a push for meaningful youth participation at all stages of the research process.

I followed two main rationales: The “ethical” grounds that youth have a right to be involved in the research and presentation of their own lives, aspirations, and struggles; and the “instrumental” grounds that it is only through working with youth that we can gain the most accurate (and unexpected) data — unmediated and untainted by our adult presuppositions and objectives — and create meaningful solutions.

Cultivating meaningful youth involvement at all stages of the research process has raised a number of interesting conceptual and practical questions, including:

- How can we not only see young people as research participants or objects of study but instead find ways to include them as research partners?
- How can an equitable and collaborative partnership between those who see themselves as researchers and youth be built, suggesting shared participation and decision making throughout the whole research process?
- To what extent can the research process itself be co-designed (vs. operating in predetermined processes)?
- What knowledge and skills are required to truly see and be seen as a partner when identifying research goals, defining research topics and questions (according to participants lived experiences), designing and conducted research, engaging in data analysis (e.g., discussing what specific results could be interpreted, collaborating on how the collection

of participant experiences, perceptions, and suggestions could be effectively represented), and participating in output creation and dissemination?

- What are the power dynamics inherent in the adult/youth relationship? What role and relevance do power structures play? And in which ways do power structures allow, prevent, or suppress the participation of young people?
- How can participatory research, as a method of social science research, best interact with the methods of community organizing and youth organizing groups? And as academics, how can we best deal with the tension of wanting a rigorous methodology to advance research, while those we partner with (e.g., schools, community organizers, activists) are often more focused on developing campaigns and mobilizing.

Despite the challenges these questions highlight, I — together with my mentors and colleagues on the Youth and Media team — became an avid advocate of “participatory research.” While the publications part of my dissertation highlight research conducted within participatory research, I would like to share here some of my observations of the process itself, and to demonstrate its validity in terms of knowledge production and advancing the field of youth and digital technologies studies.

5.1.2 From Challenge to Opportunity: Inclusion of Youth Voices and Perspectives

Some say that participatory research — sometimes called participatory action (i.e., after studying an issue, together actions/interventions that align participants’ needs and interests are developed), research, community-engaged research, participatory research and action research — represents a (radical) research method, while others consider it a research style or strategy, a re-envisioning of whose knowledge is valuable and valued, or a tool of decolonization (Bergold & Thomas, 2010; Fals Borda, 1999; Groundwater-Smith et al., 2014; Mirra et al., 2015; Rodríguez & Brown, 2009). In essence, participatory research aims to include people as research partners rather than research participants or objects of study. Participatory research values and reflects the creative and analytic abilities found in participants for whom the studied phenomenon is a daily lived experience (V. Anderson et al., 2015). Participatory research proposes an equitable and collaborative relationship between those who see themselves as more traditional (academic) researchers and members of a community (e.g., youth, people from underserved communities, specific ethnic/racial groups, people living with health issues) suggesting shared participation and decision making throughout the whole research process (Jacquez et al., 2013). The whole research process spans from identifying research goals, defining research topics and questions (according to participants’ lived experiences), designing and conducted research, engaging in data analysis (e.g., discussing the interpretation of specific results, collaborating on how the collection of participant experiences, perceptions, and suggestions could be effectively represented), and participating in output creation and dissemination.

There are some research areas where participatory research with “adults” is relatively common. Particularly in research focusing on health and underserved communities, researchers have highlighted the importance of engaging directly with individuals with specific inside knowledge instead of focusing on outside expertise (Jacquez et al., 2013).

Participatory research with youth involves young people in the construction of new knowledge by defining, studying, and addressing issues and questions — centered on youth expertise — through youth–adult partnerships (Cammarota & Fine, 2008; Checkoway & Richards-Schuster, 2003; Corporación La Caleta, 2014; Jacquez et al., 2013; Morales-García et al., 2016). Participatory research with young people is still very rare, some of the better-known examples involving youth are from the pediatrics field, where age, amongst other factors, can create clear discrepancies between adult researchers and young patients. More specifically, participatory research with youth has been applied in areas such as mental health, cancer and HIV research, and health intervention development (Carman et al., 2013; Ennis & Wykes, 2013; Powers & Tiffany, 2006; Rosenberg et al., 2016). However, in most cases, youth are often viewed as more passive contributors (i.e., discussing research questions and outcomes) rather than co-leading research projects themselves (Tsang et al., 2020). At Youth and Media, applying a participatory research approach, has meant a significant shift in how we have conducted our day-to-day work. On a daily basis, we have engaged very closely with young people and have empowered them to learn research skills so that they can formulate their own research questions and action plans. Collaboratively, we have collected data through interviews, social media posts, and other, more participatory formats. Together, we have studied the data and have co-written outputs that everyone was excited to share with others. At each stage of the research process, we have supported young people to engage in research not only as experts in their own experience, but also as investigators into their own research questions.

While I know that the process was a valuable experience for youth we work with — most gained new skills (e.g., technical/research, social, interpersonal, leadership skills), were able to form valuable connections to other people and organizations (that in many cases later served as mentors or places for internships), and many were able to showcase their work as co-authors of publications, presentations, and learning resources —, it was (and continues to be) even more valuable for me and my Youth and Media colleagues. By partnering with young people to identify thematic areas, research questions, data collection and data analysis methods, and appropriate content creation and dissemination efforts, we have been able to significantly increase the chances that our research findings will be more applicable to youth (Ito, Michalchik, et al., 2020; Jacquez et al., 2013). We have also found that, by including youth throughout the research process, we have increased the reach of our work, as policy-makers, international organizations, educators, and other stakeholders are more likely to engage with research that has direct youth input (Powers & Tiffany, 2006). Additionally, I have found that we have shifted the culture of our Center so that it even more strongly values the youth voice, which resonates with the literature around youth participatory research. Others, for instance, found that the research helped to challenge adult roles and perspectives, as well as institutional norms, cultures, and communities (Bertrand, 2019). From my own perspective, the participatory process has encouraged me to constantly explore my own blind spots and deficits and articulate them.

Consider the following examples from my research with youth in the context of my dissertation:

- Conceptualization of research themes: The paper “Youth Online and News: A Phenomenological View on Diversity,” for instance highlights the role of memes as a form of civic engagement — a topic that was proposed by a 16-year-old I was working with at the time. Additionally, for our report “Youth and Digital Citizenship+ (Plus): Understanding Skills for a Digital World,” we worked with youth summer interns in

collaborative and engaging sessions to derive the 17 areas of life that make up our concept “digital citizenship+ (plus).” Working with young people to collectively identify areas of life helped us think about these areas from different perspectives. In framing “digital access,” for example, one youth intern suggested we approach the area at both an individual *and* collective level (e.g., mesh technologies).

- Selection of research methodologies: Our decision to audio- or video-record focus groups was based on the input from a young member of the team noting that she often can not distinguish her friends’ voices (she explained that adult voices are much easier to identify).
- Analysis of research data: Particularly in the context of privacy, having a youth sounding-board at your side, helping to make sense of the data was extremely valuable. Even for me, it was challenging at times to consolidate young people’s extensive sharing of information with a deep care for their privacy and reputation.
- Sharing of our work: A number of papers we have co-published over the course of the years incorporate visuals illustrated by young people working with us. They felt that by adding such visuals to the research, a different audience would be able to engage with it.

Doing participatory research with youth can be challenging (Domecq et al., 2014; Van Staa, Jedeloo, Latour, & Trappenburg, 2010). It can definitely feel disruptive (e.g., there were many days we wished the office would be more quiet, focused, or more efficient). It also requires a different skill set to do this exciting work — this may include new ways of thinking about young people, the research projects and products, and the research expertise each can contribute. For instance, one common struggle in youth-partnered research is to be able to change the typical power dynamics inherent in the adult/youth relationship. It is necessary to ask in which way the power structure allows, prevents, or suppresses the participation of young people in decisions and actions; which position the actors take in this power structure; and which power resources they have or which they lack. This becomes important for participatory research because power is often not directly visible. For my research that meant, for instance, that I could not expect all youth to be able to come to my office (e.g., as youth advisors, researchers, summer interns). Instead, I had to meet them where they are (e.g., schools, libraries, community-based organizations). I had to demonstrate a certain openness and consideration for a young person’s age and experience level. For instance, a 12-year-old may use academic vocabulary and discuss academic theory differently than a 16-year-old. It meant that, if possible, youth should be compensated for their work, that they have a say and are being heard, and their contributions (no matter how big or small) are acknowledged in private and (if they are comfortable with it) in public (e.g., by having youth as co-authors, co-presenters, co-teachers, etc.). Whenever possible, once the more formal research phase was over, I would invest resources in co-designing solutions (e.g., learning activities, educational resources, tools, self-care tool kits) with youth that help them navigate the opportunities and challenges the digital world may present. And it also meant — and still means — that I continue to invest countless hours in listening and mentorship.

5.1.3 Conclusions

Studying youth and their lives across different disciplines are often seen as “seismographs of social and cultural changes, alerting us to new subjectivities and transformation” (Johansson & Herz, 2019, p. 2). In my research, I have been particularly interested in identifying, analyzing, and understanding such signals as possible indicators of seismic shifts with regard to youth’s

interactions with digital technologies. As discussed in section 1, the basic research question that has guided my work is focused on one particularly important tectonic feature, i.e. the extent to which youth's use of digital technologies leads, or at least has the promise to lead, to a more participatory information environment. As described in section 4 using the examples of privacy and news, my research (with the caveats discussed earlier) points at least to the potential of enhanced forms of participation and suggests that this participatory promise expresses itself in multiple ways: In addition to enhanced youth engagement in shaping their lives in the digital environment, the inclusion of youth perspectives and practices can also contribute to an evolution of traditionally mostly adult-normative understandings of concepts such as "privacy" or "news" as we move from an analog to a digitally networked environment. In this section 5, I have built upon the on-the-ground research experiences from section 4 by offering insights from methodological innovation — participatory research with youth — that can help us to unlock the participatory promises that have surfaced in the thematic examples of news and privacy. In essence, this section suggests that in the area of youth and digital technologies young people can only "serve" as seismographs if researchers develop and deploy a set of practices and infrastructures that are able to "listen" and "understand" youth signals — work that requires that youth themselves become partners in the research lifecycle. As discussed, such a functional argument for youth involvement in research is also supported by ethical arguments.

While I have developed and applied participatory research in the context of youth's use of digital technologies, the approach might be of broader applicability when considering the state of play of youth studies more generally. Over the past several decades, youth studies have become a separate field of disciplinary and interdisciplinary research with dedicated textbooks (e.g., Furlong, 2013), book series (e.g., Springer's "Young People and Learning Process in School and Everyday Life" Series), and journals (e.g., *Youth*, *Youth and Society*, and *Journal of Youth Studies*). Recent contributions have critically examined the theories of youth that have emerged from this field of research and argued in favor of building bridges between different traditions within youth research, exploring ways in which youth studies can be moved in the direction of a sociocultural perspective (Johansson & Herz, 2019). While this work highlights the need and value of a more theoretically oriented approach to youth studies, the questions of more inclusive research methods that support such an "updated" concept of youth studies remains unanswered. The participatory research approach with youth outlined in this section can contribute to bridging this methodological gap in youth studies beyond the application area of youth and digital technologies.

5.2 The Child Rights Discourse

5.2.1 Starting Point: Youth Protection Research

The increasingly important role digital technologies play in young people's lives has not gone unnoticed by policy-makers and legislators around the world at both the national and international level. In a general sense, youth's growing ability to access and use digital technologies (section 3) can be understood as a result of an incredibly complex set of loosely coordinated policy decisions since the early days of the Internet and later the World Wide Web that have enabled today's digitally connected environment with both its opportunities and challenges. In a more specific way, policy-

makers have long considered the impact of new technologies — including the Internet — on children and enacted laws and regulations in order to address the challenges that come with such socio-technological innovations. Perhaps unsurprisingly, from an adult-normative perspective, policy-makers have been particularly concerned about the risks and the protection from potential harms young people may encounter in the digital environment (Nash, 2014; OECD, 2021). Especially in the early days of the Web, the protection of young people has been the predominant focus of legislative and regulatory activity. One of the most well-known examples from this era and tradition is the Child Online Protection Act (COPA) (not to be confused with COPPA), which was passed in the United States in 1998 to restrict access by minors to any materials defined as harmful, such as pictures showing sexual acts or nudity. (The law, however, never entered into force and was struck down permanently by courts who ruled it unconstitutional.) Over the past decade, lawmakers and regulators around the world have also paid close attention to online risks such as cyberbullying, aggression, addiction, and invasion of privacy — often extensions of familiar offline risks — and enacted a myriad of protective laws, regulations, and policies that map on a typology of risks. Such a topology has developed over time and guided many countries in their child protection efforts (OECD, 2021; Ronchi & Robinson, 2019).

While evidence-based policy-making has become a “gold standard” in democratic countries and also with regard to youth (OECD, 2017), the history of online child protection offers a rich example of the conceptual and practical difficulties to meet such a standard (Byrne & Burton, 2017). Reasons why evidence-based policy-making is challenging in the digital technologies and youth context range from political pressures on law enforcement authorities in response to media coverage featuring tragic incidents involving children and digital technologies (Internet Safety Technical Task Force, 2010), to the problem of ever-changing youth behaviors vis-a-vis a rapidly evolving digital technology ecosystem.

Over the past decade, several efforts have launched to overcome these challenges and work towards a scientific evidence base for policy-making in the field of youth and digital technologies. One of the most systematic research efforts to enhance the knowledge of children’s online behaviors that have shaped policy-making is EU Kids Online / Global Kids Online (of which I am an advisor), a multinational research network that uses multiple methods, with an emphasis on large-scale surveys, to study children’s and parents’ experiences in the digital environment (Livingstone et al., 2019; Smahel et al., 2020). The findings from this research have informed recommendations and strategies for a more child-friendly digital environment, particularly in Europe and, more recently, in Latin America. My own research contributions in the context of my work as a technical advisor to UNICEF have taken the form of exploratory country case studies to provide an early navigation aid to policy-makers in the respective countries about some of the basic youth-related factors concerning digital technologies. I have helped to build such a foundational evidence-base for policy efforts in a number of countries on the African continent and in Latin America, among other regions. Similarly, a set of empirical “deep-dives” in collaboration with the Pew Research Center and focus on youth in the United States (Lenhart et al., 2013; Madden, Lenhart, Cortesi, & Gasser, 2013; Madden, Lenhart, Cortesi, Gasser, et al., 2013), to which I contributed focus group data with youth, have shaped the ways in which U.S. policy-makers as well as international organizations, such as the ITU (ITU, n.d.) and OECD (OECD, n.d.), have responded to youth’s risks online.

5.2.2 From Challenge to Opportunity: Children’s Rights and Youth Consultations

After an extended period in which youth’s engagement with digital technologies was largely seen through a lens of risks and potential harms, researchers from different disciplines started to examine the new opportunities that are associated with increased access to and usage of digital technologies (Palfrey & Gasser, 2008). The key insight from this body of (still evolving) research has been that increased access to and use of digital technologies increases a diverse set of risks, but is also associated with a growing number of opportunities (OECD, 2021). It is in this context that my own research interest turned from risk-analysis to the question of how different policies — including educational strategies or artificial intelligence national plans (Berkman Klein Center, 2020) — can be shaped in order to increase the likelihood that youth can harness a broad range of potential benefits associated with the promise of young people’s participation online. For instance, our research on news (section 4.3) has examined how digital technologies and practices can enable youth to stay informed and engaged in their communities and help them to transition from passive receivers of news to active users and even co-creators of newsworthy content. Building upon these previous explorations with a focus on youth empowerment, a most recent research effort takes a closer look at ways in which governments and educators can support young people to build the skills necessary to more fully participate in the digital economy; improve youth’s ability to stay healthy and increase their well-being; and bolster opportunities for creativity and entrepreneurship, play and recreation, identity exploration and formation, and meeting and interacting with friends, among many others opportunities (Cortesi et al., 2020; Cortesi & Hasse, 2020; Eigen et al., 2020; Lombana-Bermudez, Cortesi, et al., 2020a, 2020b).

The increased interest in and focus on opportunities — in addition to risks — of youth’s access to and use of digital technologies has not only been limited to the realm of research. The policy agenda has evolved as well. In some parts of the world, the policy discourse has shifted from an almost entirely risk-oriented and issues-driven conversation into a more holistic debate about the challenges and opportunities of digital technologies for young people. One prominent example in this context is the international debate about children’s rights for the digital environment (Lievens et al., 2019), which takes place among scholars from various fields, involves policy-makers across countries, and covers a diverse set of perspectives and issues, as I have discussed in a co-authored contribution to the academic literature on this topic (Gasser & Cortesi, 2017). From the perspective of youth participation, two dynamics that characterize recent developments in the children’s rights discourse are noteworthy: The increased interest in what are known as “participation rights” in the context of the reform discussions concerning the UN Convention on the Rights of the Child (CRC), and sustained efforts to involve youth themselves in policy debates about the future of children’s rights in the digital age.

With regard to the discussion about young people’s rights, the CRC is often invoked by policy-makers and researchers alike as a normative frame to identify the implications of digital technologies and the increasingly connected environment in which youth grow up. Scholars have used the three basic categories of rights set forth in the CRC (i.e., provision, protection, and participation rights) to map children’s use of digital technologies onto it and identify the particularly salient issues (Gasser & Cortesi, 2017; Livingstone & O’Neill, 2014). With respect to youth participation, the right to be heard in matters affecting children in accordance with age and maturity of the child (Article 12) is particularly noteworthy (Lievens et al., 2019). Additional rights

with important digital dimensions include the right to nondiscrimination (Article 2), freedom of expression and information (Article 13), freedom of association and peaceful assembly (Article 15), privacy (Article 16), information (Article 17), education (Article 28), protection from exploitation (Articles 19, 32, 33, 34, 35, and 36), and leisure, engage in play and recreational activities (Article 31) (Lievens et al., 2019). Importantly, the Committee on the Rights of the Child dedicated the Day of General Discussion in the context of its 67th Session in September 2014 to “digital media and children’s rights” in order to better understand youth’s engagement with digital technologies, with the ultimate goal “to understand the impact on and role of children’s rights in this area, and develop rights-based strategies to maximize the online opportunities for children while protecting from risks and possible harm” (OHCHR, 2014, p. 1).

As we have already observed elsewhere (Gasser & Cortesi, 2017), recent discussion about the future of youth’s digital rights have not only begun to recognize the opportunities associated with digital technologies and emphasize participation rights. In the spirit of “walking the walk,” the debates themselves have made efforts to include youth voices in these conversations, following calls for enhanced youth engagement (Collin & Hugman, 2020; Gasser, 2014, 2019; Kleine et al., 2016; Third et al., 2014, 2017). One particularly prominent effort in this context is the RErights.org initiative by the Young and Well Cooperative Research Center and the Western Sydney University in partnership with Digitally Connected (digitallyconnected.org) — a thematic network I have co-founded — and UNICEF’s Voices of Youth. RErights brings together different stakeholders and invites children globally to participate in conversation about the contours of their rights in the future and helps translate youth’s perspectives for the world of policy-making. From a participation perspective, it is interesting to observe that youth consultations from more than 16 countries highlighted the right to access as a fundamental right and precondition to exercise other rights. Findings of such participatory efforts involving youth are also informing current debates about a “Bill of Right” for the Internet age (Gasser & Cortesi, 2017), recently discussed under the rubric of “Digital Constitutionalism” (Celeste, 2019).

The child (digital) rights discourse highlights both the significance of the issues that emerge due to increased youth participation in the digital ecosystem and the promise of youth participation in policy-making efforts through surveys, focus groups, consultations, co-design workshops, and other engagement mechanisms and methods. Participatory approaches provide a new model for current and future debates and subsequent decision-making about youth policies across different areas, such as legal safeguards or skill-oriented educational policies. One of the frontiers in this context is the need for youth engagement on emerging issues at the intersection of youth and artificial intelligence (Gasser, 2019; Hasse et al., 2019). In early 2019, building upon the findings of a publication I have co-authored (Hasse et al., 2019), UNICEF’s Office for Global Insight, in collaboration with Youth and Media, the IEEE Standards Association, the World Economic Forum, and the 5Rights Foundation, launched the project #AIforChildren. This initiative is aimed at exploring how to embed child rights in the governing policies of artificial intelligence. The project seeks to support better artificial intelligence policies and systems that are founded on the protection, provision, and participation rights of children. A key aim is the development of a global Policy Guidance on Artificial Intelligence for Children (UNICEF, 2020), which intends to provide recommendations to governments and businesses for how to best uphold children’s rights in artificial intelligence policies and practices. Recognizing the importance of youth involvement, and

as part of UNICEF’s efforts to include perspectives of different stakeholders from different parts of the world, UNICEF has been hosting a series of consultations with young people in the United States, South Africa, Brazil, Sweden, and Chile, using a participatory methodology that I helped to develop.

5.2.3 Conclusions

Research and other work on youth’s rights in the digital age — including my own contributions to this field — reveal how the different dimensions of youth participation examined in this synopsis interact with each other. First, research on evolving youth practices and attitudes that are participatory in orientation point towards a series of risks and opportunities associated with youth’s interactions with digital technologies (the examples presented in section 4 illustrate two areas of youth’s digital lives). Second, a better empirical understanding of youth practices through participatory research methods described in section 5.1 have played an important role when informing policy-makers who seek to craft responses to the issues youth face when participating in the digital environment. While policy-making has not always followed the most robust evidence, participatory research has contributed to a larger shift over time from a focus mostly on risks towards a more holistic perspective that also includes the opportunities that come with young people’s digital interactions. Third, the discussion about the interpretation of so-called “participation rights” for the digital age in the context of the CRC takes the empirical and analytical dimensions of youth participation to a normative level: It not only builds upon findings from participatory research on youth participation but is also marks a shift in orientation by clarifying that young people have a right to participate in all matters affecting them, depending on their stage of development. Ongoing research projects and initiatives I am involved in build upon these participatory experiences from the youth policy and child rights discourse to inform norm-making concerning next-generation technologies, including artificial intelligence, that will increasingly shape youth’s lives in the future (Berkman Klein Center, 2020; Cortesi & Hasse, 2020; Hasse et al., 2019).

6. Future Research Avenues

In the light of the findings from and experiences with my research efforts around youth and digital technologies that are synthesized and contextualized in this synopsis, I would like to conclude by offering three areas and avenues for future research: The need for research to keep up with a rapidly evolving socio-technological environment; the need to create better interfaces between research and decision-making in the private and public spheres; and the role of participatory research(ers) in participatory rights discourse.

As summarized in section 3, youth practices and attitudes that characterize their digital lives are deeply embedded in the overall affordances of the digital ecosystem with its evolving technologies, market dynamics, changing social norms, etc.. Given the continued rapid development of all these and other relevant ecosystem-level factors, research aimed at understanding youth's use of digital technologies and evaluating the participatory promise of these interactions is an evolving target. Current work I have underway with my research group includes investigations into youth's attitudes towards a broad range of AI-based applications across a number of areas such as entertainment and education, as well as research efforts aimed at mapping the use of augmented and virtual reality by youth in the sphere of connected learning. If the past decade of youth and digital technologies research is an indicator, it can be expected that some of the core issues that have already emerged — ranging from safety, to privacy and identity, to civic engagement — will continue to be important normative areas of exploration. By the same token, past experience also suggests that changes in technological affordances and business models will have a significant, yet often unanticipated impact on youth behaviors and attitudes. Given these dynamics and acknowledging the previously mentioned “seismographic” quality of youth behavior, research will not only need to keep up with these socio-technological changes, but critically examine them in their demographic, economic, cultural, and societal contexts in order to understand the impact of the changing ecosystem around youth participation.

In addition to continued research at the empirical level, researchers in the field of youth and digital technology studies need to work with decision-makers in the private and public sectors to improve the interfaces between research and interventions to ensure that policy-making is indeed living up to the evidence-based best practices. Over the past decade, I have gained first-hand experience of the challenges related to creating and maintaining such interfaces between research and policy-making. One challenge worth highlighting is the factor of time: Participatory research, as described in section 5.1, is time-consuming and relatively slow when compared to the fast cycles of decision-making in the private and public sectors that affect youth's digital lives going forward. Moreover, insights from research are typically narrower and more specific, while policy decisions, by definition, have a generalizing quality and broad applicability. Taken together, participatory research on youth and digital technologies needs to continuously engage with decision-makers — with the necessary caveats — even before findings from research are published in peer-reviewed journals, often with years of delay. A second challenge for the future that is worth mentioning in this context, is the pressing need to create more effective mechanisms that showcase how findings from participatory research can be “translated” in such ways that they are actionable in the policy-making space. This not only requires a “translation” of academic research findings in accessible

ways, but also the translation of youth perspectives, ingrained in these findings, to the world of policy-making dominated by adult-normative perspectives.

Lastly, and as an extension of the interface challenge just mentioned, youth and digital technology researchers committed to a participatory approach have a responsibility to actively participate in the discourse about young people's rights in the digital age. As noted in section 5.2, the rights discourse has broadened, under the impression of the increased importance of digital technologies in youth's lives, from a discussion predominantly focused on risks towards a more holistic conversation about both risks and opportunities. Participatory research methods and the insights that result from these efforts can inform and support this evolutionary path of young people's rights in an increasingly digitally connected world. As mentioned in section 1 and discussed throughout this synopsis, the participatory promise of digital technologies can not be taken for granted but needs to be shaped by policy-making and design choices. It is arguably one of the most important roles participatory research(ers) can serve to actively contribute to a normative environment that acknowledges and supports young people's rights — including legal rights — to participate in the making of the future in which they will live in. Again, such an involvement in multi-stakeholder processes requires more than what researchers are typically trained to do, necessitating a rethinking of how future researchers interested in youth and technology studies are educated and trained. The stakes are high: The next generation of digital technologies — including artificial intelligence — has the potential to deeply shape the lives of generations to come, with young people being the bearer of the costs of today's decisions. Participatory research can and must help to ensure that young people's perspectives are represented and taken seriously when such decisions are made (Gasser, 2019).

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Appendix A — Resume (January 2021)

Included are publications and other engagements accomplished during the time of my dissertation.

PUBLICATIONS

Articles in Journals (Peer-Reviewed)

- Brossi, L., Castillo, A. M., Cortesi, S., Lombana-Bermudez, A., Olivera, M. N., Passeron, E., Valdivia, A. (forthcoming). Youth practices and skills in a digital age: Perspectives from Argentina, Colombia, Chile and Uruguay. [Manuscript submitted for publication] *Global Studies of Childhood*.
- Cortesi, S., & Gasser, U. (2015). Youth online and news: A phenomenological view on diversity. *International Journal of Communication*, 9(2015), 1425-1448. <https://perma.cc/P6HM-JZVC>
- Cortesi, S., & Hasse, A. (forthcoming). Youth and participatory research: Opportunities and challenges from academia. [Manuscript submitted for publication] *Journal of Participatory Research Methods*.

Chapters in Books (Peer-Reviewed)

- Gasser, U., & Cortesi, S. (2017). Children's rights and digital technologies: Introduction to the discourse and some meta-observations. In M. D. Ruck, M. Peterson-Badali & M. Freeman (Eds.), *Handbook of children's rights: Global and multidisciplinary perspectives* (pp. 417-436). Routledge. <https://perma.cc/4259-YXJ6>
- Plunkett L., Cortesi, S., & Gasser, U. (2019). Student privacy and the law in the internet age. In K. Bowman (Eds.), *The Oxford Handbook of U.S. Education Law*. Oxford University Press. <https://perma.cc/7NFZ-CGQG>
- Third, A, Bellerose, D, Keltie, E, Pihl, K, Cortesi, S., & Pawelczyk, K. (2017; [in Turkish]). Çocukların Korunma, Erişim ve Katılımlarının Dengelenmesi: Çocukların Dijital Çağda Haklarına İlişkin G.rüşleri ('From risk to opportunity: Towards a rights-based approach to understanding children's digital media practices'). In F. Odabasi (Ed.), *Dijital Yaşamda Çocuk (Children and Digital Media)* (pp. 65-88). Pegem Akademi.

Online Publications (Peer-Reviewed)

- Cortesi, S., Hasse, A., Lombana-Bermudez, A., Kim, S., & Gasser, U. (2020). *Youth and digital citizenship+ (plus): Understanding skills for a digital world*. Berkman Klein Center for Internet & Society at Harvard University. <https://perma.cc/9VEJ-HNB2>
- Cortesi, S., Pawelczyk, K., & DeLoach M. B. (2017). *Digital Champions 2016: Empowering young people with disabilities*. UNICEF.
- Haduong, P., Wood, Z., Cortesi, S., Plunkett, L., Ritvo, D., & Gasser, U. (2015). *Student privacy: The next frontier - Emerging & future privacy issues in K-12 learning environments*. Berkman Klein Center for Internet & Society at Harvard University. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2638022

- Hasse, A., Cortesi, S., Lombana-Bermudez, A., & Gasser, U. (2019). *Youth and artificial intelligence: Where we stand*. Berkman Klein Center for Internet & Society at Harvard University. <https://perma.cc/W96Q-9T7K>
- Hasse, A., Cortesi, S., Lombana-Bermudez, A., & Gasser, U. (2019). *Youth and cyberbullying: Another look*. Berkman Klein Center for Internet & Society at Harvard University. <http://nrs.harvard.edu/urn-3:HUL.InstRepos:41672537>
- Lombana-Bermudez, A., Cortesi, S., Fieseler, C., Gasser, U., Hasse, A., Newlands, G., & Wu, S. (2020). *Youth and the digital economy: Exploring youth practices, motivations, skills, pathways, and value creation*. Berkman Klein Center for Internet & Society at Harvard University. <https://perma.cc/2KC4-K5RX>
- Third, A., Cortesi, S., & Pawelczyk, K. (2017). *Balancing children's protection, provision and participation: Downloading children's views on their rights in the digital age*.

Edited Books and Volumes

- Brossi, L., Cobo, C., Cortesi, S., Doccetti, S., Lombana-Bermudez, A., Remolina, N., Winocur, R., & Zucchetti, A. (Eds.). (2018). *Youth, digital transformation, and forms of inclusion in Latin America*. <http://jovenes.digital>
- Cortesi, S., & Gasser, U. (Eds.). (2015). *Digitally connected: Global perspectives on youth and digital media*. http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2585686
- Cortesi, S., & Gasser, U. (Eds.). (2015). *Youth and online news: Reflections and perspectives*. http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2566446

Other

- Ashar, A., & Cortesi, S. (2018, February 22). *Why inclusion matters for the future of artificial intelligence*. Berkman Klein Center for Internet & Society at Harvard University. Medium. <https://medium.com/berkman-klein-center/why-inclusion-matters-for-the-future-of-artificial-intelligence-2cb9d3b1b92b>
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- Cortesi, S., & Gasser, U. (2015, October 1). On- or offline? — This is a question only adults are still asking; young people have moved on. *Credit Suisse Youth Barometer*. <https://www.credit-suisse.com/us/en/about-us/responsibility/dialogue/youth-barometer/article-archive/articles/news-and-expertise/2015/10/en/on-or-offline-this-is-a-question.html>
- Cortesi, S., Lombana-Bermudez, A., & Hasse, A. (2018, August 2). *Sharing learning tools for youth digital life*. <https://medium.com/berkman-klein-center/sharing-learning-tools-for-youth-digital-life-dd8d6eb56e7a>
- Kanchinadam, T., Sallick, S., Robinson, Q., Whitby, J., Kim, S., Hasse, A., Cortesi, S., & Lombana-Bermudez, A. (2018, November 2). *How youth are reinventing Instagram and why having multiple accounts is trending*. <https://medium.com/berkman-klein-center/how-youth-are-reinventing-instagram-and-why-having-multiple-accounts-is-trending-ac6eb0a288db>

- Lombana-Bermudez, A., Cortesi, S., Fieseler, C., Gasser, U., Hasse, A., Newlands, G., & Wu, S. (2020, June 29). *How youth are contributing to the digital economy and why their participation is more important than ever*. Berkman Klein Center for Internet & Society at Harvard University. Medium. <https://medium.com/berkman-klein-center/how-youth-are-contributing-to-the-digital-economy-and-why-their-participation-is-more-important-59c3175cc98f>
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- Third, A, Lala, G, Keltie, E, Pihl, K, Bellerose, D, Moody, L, Theakstone, G, David, L, Cortesi, S., & Pawelczyk, K. (2016). *Building a youth-centred global online consultation platform: Reflections on developing the RErights.org platform*. Young and Well CRC, Melbourne.
- UNICEF (2015, November). Código de Convivencia Web para familias. Safer Internet Day 2015. https://www.unicef.org/argentina/spanish/COM-Convivencia-Web_CONECTADOSSUR.pdf

SELECTED LECTURES, PRESENTATIONS, AND EXPERT WORKSHOPS

Co-Hosted

Starting in January 2019, my team and I together with Facebook, in partnership with the national PTA (Parent Teacher Association; including 25,000 local PTAs across the country with a goal of reaching every American public school), will support the hosting of at least 200 parent nights in all 50 states and develop a toolkit for U.S. families and educators. See the announcement here: <https://www.pta.org/home/programs/connected/digital-families> and https://newsroom.fb.com/news/2018/09/digitalfamiliescommunityevents_pta.

As co-founder of Digitally Connected, I had the pleasure of co-hosting four youth and digital media flagship events, including:

- (1) January 2018: The School of Collective Communication Sciences of the University of Costa Rica, together with the Institute of Communication and Image of the University of Chile, Faro Digital Argentina, the Berkman Klein Center for Internet & Society at Harvard University, and UNICEF co-hosted the third regional symposium “Conectados al Sur: Costa Rica” on digital transformation and new challenges for the inclusion of youth. Additional information:
 - Overview: <http://brk.mn/cascroverview>
 - Agenda: <http://brk.mn/cascragenda>
 - Pictures: <http://brk.mn/cascrpictures>
 - Videos: <http://brk.mn/cascrvideos>
- (2) May 2016: The Institute of Communication and Image at the University of Chile, UNICEF, and the Berkman Klein Center for Internet & Society co-hosted the second regional symposium “Conectados al Sur: Chile” on children, youth, and digital media, to map and explore the state of relevant research and practice at the national, regional, and international levels, share and discuss insights and ideas across countries, and encourage collaboration between participants.

- (3) December 2014: As part of the Digitally Connected events series and bringing together experts from Latin America and the Caribbean, the Berkman Klein Center at Harvard University, the Ministry of Justice and Human Rights of Argentina, and UNICEF co-hosted the first regional symposium in Buenos Aires called “Conectados al Sur” on children, youth, and digital media.
- (4) April 2014: The Berkman Klein Center at Harvard University and UNICEF co-hosted, in collaboration with PEW Internet, EU Kids Online, the Internet Society (ISOC), Family Online Safety Institute (FOSI), and YouthPolicy.org, a first of its kind international symposium on children, youth, and digital media at Harvard University, to map and explore the global state of relevant research and practice, share and discuss insights and ideas from the developing and industrialized world, and encourage collaboration between participants across regions and continents.

I was also deeply involved in the organization of the following milestone event:

- November 2017. In early November, on behalf of a global group of Internet research centers known as the [Global Network of Internet & Society Centers](#) (NoC), the [Institute for Technology & Society of Rio de Janeiro](#), and the Berkman Klein Center for Internet & Society at Harvard University co-organized a [three-day symposium](#) on artificial intelligence and inclusion in Brazil. The event brought together representatives from academia, advocacy groups, philanthropies, media, policy, and industry from more than 20 nations to start identifying and implementing ways to make the class of technologies broadly termed “AI” more inclusive. The symposium – attended by about 170 people from countries including Nigeria, Uganda, South Africa, Kenya, Egypt, India, Japan, Turkey, and numerous Latin American and European nations – was intended to build collaborative partnerships and identify research questions as well as action items. These may include efforts to draft a human rights or regulatory framework for AI; define ways to democratize data access and audit algorithms and review their effects; and commit to designing and deploying AI that incorporates the perspectives of traditionally underserved and underrepresented groups, which include urban and rural poor communities, women, youth, LGBTQ individuals, ethnic and racial groups, and people with disabilities.

Hosted by Leading Universities

July 2020: Presentation, “Youth and Digital Citizenship”, CO:RE (Children Online: Research and Evidence funded by the EU H2020) & London School of Economics, virtually.

November 2019: Presentations, “Youth and Media: Trends and Developments” and “Youth and Artificial Intelligence”, ZHAW Zürcher Hochschule für Angewandte Wissenschaften, Zurich, Switzerland

November 2019: Presentation, “10 Things I Learner from Young People”, Festival of Technology, Polytechnic of Turin, Turin, Italy

November 2019: Panel, “Youth, Education, and Digital Technology”, Festival of Technology, Polytechnic of Turin, Turin, Italy

September 2019: Keynote, “Youth and AI”, Symposium on Humane Artificial Intelligence, East-West Center, Honolulu, Hawai’i

May 2019: Guest lecturer, “Jugendliche Online – Offline”. Wie gelingt die Balance? Lucerne University of Applied Sciences and Arts, Lucerne, Switzerland

April 2019: Guest lecturer, Professor Urs Gasser, Comparative Online Privacy, Harvard Law School, Cambridge, USA

August 2018: Presentation, “Addressing the Youth Perspective: Why Including Youth Voices, Issues, and Activities Matters”, University of St.Gallen, Switzerland

June 2018: Presentation, “Youth and Online News”, Nieman Lab, Harvard University, Cambridge, USA

June 2018: Presentation, “Understanding Younger Generations: A Study of People Using the Web”, Digital Innovation Academy, Harvard University, Cambridge, USA

April 2018: Guest lecturer, Professor Urs Gasser, Comparative Online Privacy, Harvard Law School, Cambridge, USA

January 2018: Presentation, “Digital Citizenship”, University of Costa Rica, San Jose, Costa Rica

November 2017: Presentation, “Artificial Intelligence and Education”, (Un)Colloquium, MIT Media Lab, Cambridge, USA

October 2017: Presentation and Workshop, “Inclusion”, Universidad del Rosario, Bogota, Colombia.

October 2017: Presentation, “Youth and Artificial Intelligence”, Universidad de Chile, Santiago, Chile

April 2017: Guest lecturer, Professor Urs Gasser, Comparative Online Privacy, Harvard Law School, Cambridge, USA

April 2017: Panel, “Fake News, Concrete Responses: At the Nexus of Law, Technology, and Social Narratives” moderated by Harvard Law School dean Martha Minow, Harvard Law School, Cambridge, USA

October 2016: Keynote, “The Positive and Negative Aspects of the Internet: Bullying in a Digital Age”, Universidad de los Andes, Bogota, Colombia

April 2016: Panel, “Creating a Kinder World Together: How to Combat Cyberbullying”, Harvard Law School, Cambridge, USA

April 2016: Guest lecturer, Professor Urs Gasser, Comparative Online Privacy, Harvard Law School, Cambridge, USA

December 2015: Keynote, “Online Child Safety”, University of Chile, Santiago, Chile

October 2015: Presentation, “How Digitally Connected Facilitates Youth Participation”, Tsinghua University and UNICEF Youth Innovation Forum, Beijing, China

Hosted by UNICEF / UNESCO / UN / OECD

April 2020: Presentation and Moderation, “Children’s Rights in Times of Uncertainty”, UNICEF & Lego, virtually. [Available here: <https://www.unicefusa.org/stories/protecting-childrens-rights-online/37385>]

December 2019: Presentation, “[Artificial Intelligence and its Impact on Young People](#)”, Council of Europe, Strasbourg, France.

November 2019: Panel, “[Inclusion Online, Diverse Knowledge: New Rules?](#)”, Internet Governance Forum, Berlin, Germany

November 2019: Panel, “[Developing Policy Guidelines for AI and Child Rights](#)”, Co-Hosted with UNICEF, Internet Governance Forum, Berlin, Germany

May 2019: Keynote, “Youth and AI: Where We Stand”, AI for Good Global Summit 2018, organized by the ITU and sister United Nations agencies, Geneva, Switzerland

October 2018: Keynote, “How Children Grow Up in a Digital Environment”, Expert Consultation by the Organisation for Economic Co-operation and Development (OECD), workshop “Protection of Children in a Connected World” hosted by the University of Zurich Digital Society Initiative, with the support of the Swiss Government and co-sponsored by the Korean Government, Zurich, Switzerland

November 2018: Round Table, “[Emerging Youth Practices and the Digital Economy](#)”, Internet Governance Forum, Paris, France

November 2018: Round Table, “[Fostering Digital Social Innovation in the Global South](#)”, Internet Governance Forum, Paris, France

November 2018: Panel, “[Children and AI - Securing Child Rights for the AI Generation](#)”, Internet Governance Forum, Paris, France

November 2018: Round Table, “[Unleash the Power of Digital Economy & Society with Mobile](#)”, Internet Governance Forum, Paris, France

December 2017: Presentation, “Blurring Lines Between Work and Play: Youth Practices and the Digital Economy”, Internet Governance Forum, Geneva, Switzerland

November 2016: Presentation and panel moderation, “Children’s Rights and Digital Technologies: Introduction to the Discourse and Some Meta-Observations” and expert panel discussion on “What does a better internet for children look like? Whose responsibility is it?”, UNICEF Headquarters New York, USA

October 2016: Presentation, “Conectados al Sur”, UNICEF Argentina, Buenos Aires, Argentina

September 2015: Keynote, “Youth and Digital Media: General Perspectives and Global Frameworks” & “Prepare Students for the Online Environment: Skills for Digital Success”, The Ethical Dimensions of the Information Society and Internet Privacy, Ministry of Education St.Kitts Nevis National Commission for UNESCO, St.Kitts

(Co-) Hosted by Governments

August 2020: Keynote, “Jovenes y tecnologias digitales: Que nos dice la investigacion? [Spanish]”, Ministry of Science, Technology, Knowledge and Communication of the Government of Chile, 25th Anniversary, virtually.

June 2020: Presentation, “Youth Engagement”, International Telecommunication Union hosted by ITU-D, virtually.

September 2019: Presentations, “Youth and Digital Citizenship” and “Youth and Artificial Intelligence” in the context of Child Protection, Revision of the OECD Recommendation on the Protection of Children Online, OECD, Paris, France.

July 2019: Keynote, “Youth, Personal Data, and Social Media”, VII International Conference for the Protection of Personal Data, organized by the Superintendence of Industry and Commerce, Cartagena, Colombia

October 2018: Keynote, “How Children Grow Up in a Digital Environment”, Expert Consultation by the Organisation for Economic Co-operation and Development (OECD), workshop “Protection of Children in a Connected World” hosted by the University of Zurich Digital Society Initiative, with the support of the Swiss Government and co-sponsored by the Korean Government, Zurich, Switzerland

Other

April 2020: Presentation, “Young People, Learning, and the Importance of Digital Skills – in Times of COVID-19”, TikTok Education, virtually.

February 2020: Keynote, “Youth and Well-Being”, SaferNet Brazil and the Brazilian Internet Steering Committee (CGI.br/NIC.br), São Paulo, Brazil. [Available here: <https://www.youtube.com/watch?v=fpz9x199pgE&list=RDCMUCscVLgae-2f9baEXhVbM1ng&index=13>]

November 2019: Presentation, “The Next Generation and Digital Media”, Schmidheiny Foundation, Interlaken, Switzerland.

June 2019: Session, “The Network of Internet & Society Centers (NoC) Cards-Based Meetup”, RightsCon 2019, Tunis, Tunisia

June 2019: Session, “Human Libraries: NoC Skills Session”, RightsCon 2019, Tunis, Tunisia

June 2019: Session, “Human Libraries: Meet NoC Women”, RightsCon 2019, Tunis, Tunisia

January 2019: Presentation, “Youth, Artificial Intelligence, & Psychology”, Asia Conference on Fairness, Accountability, and Transparency (FAT* Asia 2019), Hong Kong, Hong Kong

August 2018: Keynote, “Youth and the Life and/or News of Tomorrow”, Tamedia, Berne, Switzerland

February 2018: Presentation. “Youth and Social Media”, Red Cross, Aarau, Switzerland

February 2018: Presentation. “Youth and the Life of Tomorrow”, Jelmoli, Zurich, Switzerland

December 2017: Panel, “Young, Safe and Free: Respecting Children's Online Privacy and Freedom of Expression”, RightsCon, Toronto, Canada

November 2017: Presentation. “Youth and the Lives of Tomorrow”, Global Symposium on Artificial Intelligence & Inclusion, Rio, Brazil. Co-organized on behalf of the NoC by the Institute for Technology and Society of Rio de Janeiro (ITS Rio) and the Berkman Klein Center for Internet & Society at Harvard University with the support of the Ethics and Governance of Artificial Intelligence Fund, International Development Research Centre (IDRC), and the Open Society Foundations, in collaboration with the Museum of Tomorrow.

October 2017: Presentation, “What We Can – and Should – Learn from Young People about Online Privacy”, Privacy, Personality and Flows of Information 3rd Edition: Asian Perspectives for Privacy, Hong Kong

September 2017: Presentation, “Youth and Online News. Die Mediennutzung der Jungen Generation”, Swiss Media Forum, Luzern, Switzerland

June 2017: Panel, “The Social (Media) Life of Teens: How to Understand the Digital Present”, World Department Store Forum 2017, Toronto, Canada

November 2016: Keynote, “Youth and Online News”, Mobile Media Day 2016, Wuerzburg, Germany. Visit: <http://www.slideshare.net/Lokalrundfunktage/mmd-16-sandra-cortesi-youth-and-online-news> and <https://www.youtube.com/watch?v=OkLQZMV1>.

October 2015: Presentation, “The Social (Media) Life of Teens: What Pediatricians Need to Know and Do”, American Academy of Pediatrics' 2015 National Conference & Exhibition, Washington, DC, USA

October 2015: Presentation, “Youth and Social Media”, Police Innovation Conference 2015, Boston, USA

MEMBERSHIPS, COMMITTEE WORK, AND OTHER ACTIVITIES

The Joan Ganz Cooney Center (JGCC) at Sesame Workshop, By/With/For Youth: Inspiring Next Gen Public Media Audiences, Advisory Board, June 2020 – Present

20 Minuten – a member of the TX Group (previously Tamedia.ch) [[announcement](#)], Board of Directors / Verwaltungsrat, 2020 – Present

World Economic Forum, Global Future Council, Virtual & Augmented Reality, 2019 – 2020

Nexa Center on Internet and Society, Board of Trustees, April 2019 – Present

Digital Asia Hub, Steering Committee, September 2015 – Present

Swiss Media Forum, Advisory Board, August 2018 – Present

20 Minutes Youth Lab (<https://youthlab.20min.ch/>), Advisor, September 2018 – Present

UNICEF, Digital Citizenship Safety, Working Group Member, June 2011 – Present

Global Kids Online, International Advisory Group, September 2015 – Present

The Rights of the Child for the Digital Age, Advisory Board Member, June 2014 – June 2018

Convergence Academies, Columbia College Chicago, Advisory Team, November 2013 – December 2018

Harvard University, Digital Problem-Solving Initiative, Mentor, June 2013 – June 2018

McCormick Foundation, Why News Matters initiative, Advisory Board, April 2014 – October 2015

RECORDED TALKS

- February 2020: Keynote, “Youth and Well-Being”, SaferNet Brazil and the Brazilian Internet Steering Committee (CGI.br/NIC.br), São Paulo, Brazil. [Available here: <https://www.youtube.com/watch?v=fpz9x199pgE&list=RDCMUCscVLgae-2f9baEXhVbM1ng&index=13>]
- November 2019: Recap of the “Youth, Education, and Digital Technology” panel at the, Festival of Technology in Turin (Italy), <https://www.youtube.com/watch?v=FNvBNw4ILEs&list=PLJp5XzEMRKqOKjw2jGafC LBV5fdQ6spBz&index=17>
- October 2018: Participant in a tv show hosted by the Swiss National TV Broadcaster, Medienclub, “Youth – Desperately Wanted!”, <https://www.srf.ch/sendungen/club/medienclub-junge-verzweifelt-gesucht> [Viewers: 200,000]
- September 2018: Participant in a tv show hosted by the Swiss National TV Broadcaster, Arena Reporter, “Youth and Mobile Phone Addiction”, <https://www.srf.ch/play/tv/arenareporter/video/legt-das-handy-weg?id=3e7be0dc-435d-42a8-8c33-3050dbc4b582&station=69e8ac16-4327-4af4-b873-fd5cd6e895a7> [Viewers: 150,000]
- November 2017: Presentation, “Youth and the Lives of Tomorrow”, <https://www.youtube.com/watch?v=gmeRqzO6ehk>
- September 2017: Presentation, “Youth and Online News. Die Mediennutzung der Jungen Generation”, <https://vimeo.com/234561590>
- April 2016: Fake News, Concrete Responses: At the Nexus of Law, Technology, and Social Narratives, <https://www.youtube.com/watch?v=RbPT6Y78PiM>
- November 2016: Youth and Online News, <http://www.slideshare.net/Lokalrundfunktag/mmd-16-sandra-cortesi-youth-and-online-news> and <https://www.youtube.com/watch?v=OkLQZMV1mPE&t=516s>.
- October 2016: The Positive and Negative Aspects of the Internet: Bullying in a Digital Age, <https://uniandes.edu.co/es/noticias/educacion/conductas-de-los-estudiantes-en-redes-sociales-digitales> [starting at 1:04:00]
- April 2016: Creating a Kinder World Together: How to Combat Cyberbullying, <https://www.youtube.com/watch?v=sv3Az7Ac1AU>

MEDIA COVERAGE

- October 2020: “Jugendliche haben ein Recht auf Partizipation” <https://www.tagesanzeiger.ch/jugendliche-haben-ein-recht-auf-partizipation-506972605375>
- August 2019: Portrait about me and my work on Swissinfo where I was named as Swiss Digital Pioneer, “Sie hat die digitale Jugend im Blick” <https://www.swissinfo.ch/ger/wirtschaft/swiss-digital-pioneers-sie-hat-die-digitale-jugend-im->

[blick/45102286?utm_medium=socialflow&utm_content=o&utm_source=twitter&utm_campaign=own-posts](https://www.nzz.com/beitrag/blick/45102286?utm_medium=socialflow&utm_content=o&utm_source=twitter&utm_campaign=own-posts)

- July 2019: Short portrait about my work in the NZZamSonntag, “Supercedi: Wer ist die Nummer eins der Smartphone-Generation?” <https://nzzas.nzz.ch/hintergrund/supercedi-wer-ist-die-nummer-eins-der-smartphone-generation-ld.1498689?reduced=true>
- December 2018: Portrait about me and my work in Horizonte, the Swiss National Science Foundation magazine, “Ihr Untersuchungsobjekt: Generation Instagram” <https://www.horizonte-magazin.ch/2018/12/06/ihr-untersuchungsobjekt-generation-instagram>
- October 2018: Annabelle, “Swiss Female Maker: Sandra Cortesi” [[here](#)] and [[here](#)]
- March 2018: Aargauer Newspaper “Youtubisierung des Blicks” <https://www.aargauerzeitung.ch/kommentare-aaz/youtuberisierung-des-blicks-132334256> [Circulation: 200,000]
- February 2018: Migros-Magazin “Sandra Cortesi über das Potenzial der Digitalen Welt” <https://www.migrosmagazin.ch/sandra-cortesi-ueber-das-potenzial-der-digitalen-welt> [Circulation: 2,400,000]
- February 2018: Migros-Magazin “Sandra Cortesi über ihre eigene Mediennutzung” <https://www.migrosmagazin.ch/sandra-cortesi-ueber-ihre-eigene-mediennutzung> [Circulation: 2,400,000]
- November 2017: O Globo “We still need to better understand how to create and use artificial intelligence systems, says researcher” <https://oglobo.globo.com/sociedade/ainda-precisamos-definir-como-criar-usar-sistemas-de-inteligencia-artificial-diz-pesquisadora-22042276> [Circulation: 320,000]
- October 2017: La Nación, “Cómo mejorar la relación que padres e hijos tienen alrededor de la tecnología” <http://www.lanacion.com.ar/2074083-como-mejorar-la-relacion-que-padres-e-hijos-tienen-alrededor-de-la-tecnologia> [Circulation: 160,000]
- June 2017: WWD, World Department Store Forum Coverage, http://blogs.harvard.edu/sandracortesi/files/2017/06/Sandra-Cortesi_WDSF-2017.pdf
- May 2017: Huffington Post, “Education in the Age of Trump”, https://www.huffingtonpost.com/entry/education-in-the-age-of-trump_us_59089204e4b05279d4edbfba
- March 2017: Harvard Gazette, “Fake news is giving reality a run for its money”, <http://news.harvard.edu/gazette/story/2017/03/harvard-panelists-discuss-future-of-journalism-in-fake-news-world>
- October 2016: El Espectador, “¿Cómo evitar el “cyberbullying”?”, <http://www.elespectador.com/noticias/educacion/evitar-el-cyberbullying-articulo-661136>
- August 2016: Lawfare, “A List of Female Technology Policy Experts”, <https://www.lawfareblog.com/list-female-technology-policy-experts>
- May 2016: La Semana, “Bullying cibernetico en la Universidad de los Andes”, <http://www.semana.com/nacion/articulo/bullying-cibernetico-en-la-universidad-de-los-andes/504341>

- May 2016: Harvard Law Today, “Creating a Kinder World”, <https://today.law.harvard.edu/students-host-mini-symposium-data-privacy-u-s-eu/>
- February 2016: UNICEF Magazine, “10 claves sobre adolescentes y tecnología”, <http://www.amigodelosninos.org.ar/revistauni/UNI15.pdf>
- June 2016: University of Chile, “Conectados al Sur: Chile – an Overview”, <https://spark.adobe.com/page/wsM8T>
- October 2015: Women of China, “Tsinghua-UNICEF Youth Forum Highlights Cross-Continent Innovation”, <http://m.womenofchina.cn/womenofchina/xhtml1/features/1510/1622-1.htm>

Appendix B — Copy of Relevant Publications

Submitted to the Journal of Global Studies of Childhood.

Youth Practices and Skills in a Digital Age: Perspectives from Argentina, Colombia, Chile and Uruguay

Lionel Brossi

University of Chile, Chile

Mauricio Olivera

University of the Republic, Uruguay

Ana María Castillo

University of Chile, Chile

Sandra Cortesi

Berkman Klein Center for Internet & Society, Harvard University, USA

Andres Lombana-Bermudez

Javeriana University, Colombia. Centro ISUR, Del Rosario University, Colombia

Ezequiel Passeron

Faro Digital, Argentina

Andrea Valdivia

University of Chile, Chile

Abstract

Digital technologies are reshaping youth (ages 12-18) lifeworlds. Through daily digital practices, they are able to earn new skills; communicate and socialize with friends; engage broadly with information and content; and share perspectives, interests, and identities. Knowing how to navigate the digital world, acquire the relevant skills, and be able to pursue interests, passions, and goals is as important as ever. But engagement with the digital world is tied to structural inequities, lack of opportunities, and the absence of effective policies. This article presents voices and perspectives of youth from focus groups conducted in Argentina, Colombia, Chile and Uruguay as part of the Hablatam project. First, we will highlight findings about how youth engage with the digital world — focusing particularly on existing access conditions, the spaces and platforms they use the most, and the contents and formats they enjoy. Second, we intend to discuss some of the skills they report gaining through their engagements. Lastly, we hope to spark a discussion about some of the challenges and opportunities youth in South America report encountering when engaging with the digital world, and what could be done to reduce some of the most striking gaps and barriers and empower youth to leverage the opportunities the digital world has to offer.

Keywords: youth, digital practices, digital skills, digital technologies, Latin America.

Introduction

Over the past several years, there has been an increase in youth (ages 12-18) access to digital technologies and (in some cases) ownership of Internet-accessible devices, particularly smartphones. In addition to having better access to devices and being able to go online more easily, many youth now also have access to a greater variety of online platforms and spaces. One of the promises of these developments is that, as youth grow up in this new digital world and are increasingly able to access and use digital tools and platforms to engage with content online, they will be able to increasingly leverage the opportunities around creativity (Gasser & Cortesi, 2017), learning, entrepreneurship, and innovation the digital world has to offer. While some youth are passionate users of digital technologies and are able to invest significant time and energy to take advantage of these opportunities, our results demonstrate not all youth are able to access digital technologies, possess the relevant skills, and make use of the opportunities equally.

By way of context, three developments have significantly shaped youth' engagement with the digital world: (1) access conditions; (2) the advent of social media and gaming platforms; and (3) the increase in skills. The following paragraphs highlight a number of observations for each of these developments.

(1) Internet access rates among youth vary depending on demographic variables such as location, age, gender, skill and educational level, and socioeconomic status. While the availability of statistics on youth access and use of digital technologies is limited, and data that does exist is rarely truly current or representative of all youth in a particular country or community, overall youth in the Global South have less access to digital technologies than those in the Global North (Livingstone et al., 2019; Third et al., 2014; 2017; UNICEF, 2017). Generally speaking, youth and people over the age of 66 tend to be the groups that have the least access to the Internet. For many youth, smartphones have become the most common means for engaging with the digital world (Cobo, 2020; Livingstone et al., 2019; Ofcom, 2019; Schrock, 2015); but smartphones are still not accessible to all, and less than half of the people in Latin America and the Caribbean under the age of 25 are able to access the Internet (CEPAL, 2020). Those who do have access to digital technologies often experience both poor infrastructure and low quality Internet, which may not enable them to fully take advantage of the opportunities digital technologies may offer (Livingstone et al., 2018; Lombana-Bermudez et al., 2020; Cortesi et al., 2020).

(2) *Platforms and Spaces.* For youth who are able to go online, the digital world offers a range of tools, from social media platforms like Facebook, Instagram, Twitter, and TikTok; video and streaming sites like YouTube and Netflix; messaging applications like Snapchat and WhatsApp; music-sharing sites like Spotify; online blogs like Tumblr; dating applications like Tinder; and video games like Minecraft and Fortnite. These tools afford youth opportunities to engage with information, connect with friends and experiment with identity, create content, or stay up to date with the news and pop culture. But there are differences in use, signaling differences in access: Urban youth in Latin America and the Caribbean are almost 25 percent more likely to use social media than their rural counterparts (OECD, 2020).

(3) *Skills and Areas of Life.* Understanding the skills¹ youth need for a digital world has become a topic of growing importance, with different stakeholders and communities debating

¹ A conceptual debate about the term "skill" is beyond the scope of this paper. For the purpose of the paper, we are using the term "skill" as defined by the OECD (2019, p. 5). Skills encompass "1) practical (e.g., utilizing new digital technology devices) and physical (e.g., using a digital device, such as a tablet or mobile phone, to achieve a specific

what meaningful learning spaces, modes of engagement, and educational content should entail. A body of research explores the types of skills, clustered under different concepts (e.g., digital literacy, digital citizenship+, media literacy, new media literacies, 21st century skills, and digital competence), with differences in conceptual framing and addressed skills (Cortesi et al., 2020; UNICEF, 2019). Influenced by diverse viewpoints, several members of the Hablatam team and co-authors of this article have developed their own conceptual rationale outlined in a recent report, “Youth and Digital Citizenship+ (Plus): Understanding Skills for a Digital World” (Cortesi et al., 2020). The report synthesizes different concepts and frameworks into a set of 17 areas to guide thinking about the relevant skills youth need to navigate the digital world. Five of these 17 areas are particularly relevant for this article, namely: (1) *digital access*, the ability² to connect to and access the Internet, individually or collectively (e.g., mesh technologies); (2) *digital (literacy)*: The ability to use the Internet and other digital tools and platforms effectively to find, interact with, evaluate, create, and reuse information (Palfrey & Gasser, 2016), and the ability to comprehend and work through conceptual problems in digital spaces (Carretero et al., 2017); (3) *information quality*, the ability to find, interact with, evaluate, create, and reuse information (e.g., news, health information, personal information) effectively (Palfrey & Gasser, 2016); (4) *media (literacy)*, the ability to analyze, evaluate, circulate, and create content in any media form (e.g., print, visual, interactive, audio), and to participate in communities and networks; and (5) *content production*, the ability to produce (digital) content using (digital) tools. We are using, as defined in Cortesi et al., (a person’s) “ability” as the capacity to apply practical and physical, cognitive and meta-cognitive, and social and emotional skills.

Methodology

We conducted 16 focus groups with over 100 participants (N=107; 56 female and 51 male) across Argentina, Colombia, Chile and Uruguay. Focus group lasted 90 minutes and participants ranged in age from 12 to 18. Although neither research sample was designed to constitute representative cross-sections of particular populations, the sample includes urban youth, attending public schools situated in traditionally marginalized communities.

Focus group conversations were structured but flexible; interviewers were guided by a common questionnaire addressing themes such as “information quality” (Gasser et al., 2012), content gaps, and digital skills, but the interviews also had the flexibility to adapt questions according to emergent or cross-cutting themes.

The focus group method was selected because group interviews tend to reveal participants’ differences of opinion and personal preferences. Additionally, the methodology lends itself to this research because behaviors such as decision-making process are inherently unobservable in a research setting, but can be identified through reflection by individual participants, while the interaction between participants allows comparisons between behaviors and preferences to be drawn.

outcome, like finding information online for a school assignment) skills, 2) social and emotional skills (e.g., collaboration, self-efficacy, empathy), and 3) cognitive and meta-cognitive skills (e.g., self-regulation, motivation to learn, creativity, and critical thinking).”

² We are using, as defined in Cortesi et al., (a person’s) “ability” as the capacity to apply practical and physical, cognitive and meta-cognitive, and social and emotional skills.

The research team developed a coding scheme after iterative readings of the interview transcripts. The first iteration yielded major emergent themes, with successive readings focusing on more specific topics. The analysis was supported by the NVivo11 program. All focus groups quotes in this article have been translated from Spanish into English. Acknowledging that direct translation can omit key subtleties, quotes were minimally adapted to preserve the meaning, sense and intention conveyed in Spanish.

Findings

Engaging with the Digital World

How Youth Access the Digital World

The access and connectivity conditions among focus group participants (i.e., participants; using this terminology moving forward) varied but, broadly speaking, most participants seem to rely on WiFi (i.e., did not have unlimited mobile connectivity to be able to use the Internet anywhere and anytime), either public, at school, or at home. Most participants did not indicate having consistent access to a laptop or desktop computer, but instead stated engaging with the digital world primarily through smartphones. On many occasions, participants reported having only one smartphone shared by the whole family, suggesting limitations on Internet access based on, for instance, a parent's work schedule. While smartphones do afford participants a variety of modes of communication and opportunities for engagement, they tend to make some activities, especially different forms of more creative content creation and sharing, less accomplishable, making it apparent that not all participants are able to experience the digital world in the same ways.

Interviewer: *What would you like to improve or learn in gaming?*

Participant 1: *Now we have WiFi at home, but I don't have a computer... The only impediment that I have for not being able to learn [how to play games] is the lack of equipment. (Argentina, 13, female)*

Interviewer: *How do you access the Internet? Do you use a phone or computer?*

Participant 1: *Phone. (Argentina, 13, female)*

Participant 2: *Computer. And phone. (Argentina, 14, female)*

Participant 3: *Phone. (Argentina, 14, male)*

Interviewer: *So what you are mostly using, is your phone?*

All: *Yes.*

Interviewer: *Do you own your own phone? Or do you use the phone of a family member?*

Participant 1: *I use mine. (Argentina, 14, male)*

Participant 2: *Mine broke so I use my mother's phone. (Argentina, 13, female)*

Participant 3: *I have one that I'm sharing with my sister. But it was mine originally. (Argentina, 13, male)*

Interviewer: *Do you use any paid applications? If so, which ones? If not, why not?*

Participant 1: *Unfortunately I'm not able to pay for applications. I can't afford it. I have never paid for an application. Not even for a video game. (Chile, 15, female)*

How Youth Use the Internet and Spend Their Time

Participants are passionate users of social media and gaming platforms. While they have diversified which platforms they use, there seems to still be a preference for Facebook and Instagram, while Snapchat and TikTok were mentioned to a lesser extent. Social media is

important for communicating with friends, including those who do not live in close proximity. YouTube and WhatsApp occupy a special position — both are seen as the most relevant platforms for engaging with content more actively. From learning about current events, to dealing with school work, to sharing something relevant with others, both platforms seem crucial. Many participants (independent from their gender identity) report gaming as one of their favorite digital practices. Participants mentioned playing video games mostly on mobile phones, followed by computers, and, in fewer cases, using a gaming console. Even though they noted a preference for playing online and for playing multiplayer games, many participants stated not having enough Internet data, broadband connectivity, or memory space in their devices to do so. Some of those without high quality connectivity or the relevant devices mentioned finding workarounds for these access issues by, for instance, using public WiFi, playing at someone else's house, or using devices belonging to friends.

Interviewer: *What do you do online?*

Participant 1: *I play games. Shooter games. Call of Duty. Fortnite. Minecraft. (Chile, 17, male)*

Participant 2: *I like YouTube. And WhatsApp and Discord. (Chile, 16, female)*

Participant 3: *TV shows, music, movies. (Chile, 16, male)*

Participant 4: *Social media. Facebook, Instagram. (Chile, 17, female)*

Interviewer: *What activities do you do with your cell phones? For example, which apps do you use and what for?*

Participant 1: *I mostly use Facebook, WhatsApp, and YouTube. On YouTube I can watch videos, movies, anything that's out there. Things that are funny. I use WhatsApp to see statuses and keep chatting and Facebook to see what others have posted. (Colombia, 16, female)*

Interviewer: *And what do you use?*

Participant 2: *I use Instagram to find recipes and cute clothes and to see memes and stories. (Colombia, 17, female)*

Participant 3: *I mostly use Pinterest and Facebook to look at stories. (Colombia, 16, female)*

Interviewer: *Is social media important to you?*

Participant 1: *For me it's important. It allows me to communicate with others. I'm not from this country and I enjoy communicating with my sisters, my mother, with the people back in my home country, with my family. (Chile, 17, female)*

Interviewer: *And with the games, how do you do with online games, do you also download them?*

Participant 2: *They are free; but, they use a lot of memory space. (Colombia, 14, female)*

Interviewer: *And when they use a lot of memory space, what do you do?*

Participant 2: *Well, you have to delete a lot of things.*

Participant 1: *Call of Duty, which uses about 64 Gigabytes, it almost takes up half of my cell phone memory and I have downloaded it. (Colombia, 14, female)*

Interviewer: *And do you pay for the games or are they free?*

Participant 2: *Paying for a game is complicated. You have to first add money through Efecty (Colombian money transfer service).*

Participant 1: *I download more things with my mom's cell phone.*

Interviewer: *When do you usually connect to the Internet?*

Participant 1: *When I get home. (Colombia, 14, male)*

Participant 2: *When I'm at home and have WiFi access. When I'm out of the house, I connect to data. (Colombia, 14, female)*

Participant 1: *I sometimes have to steal the neighbor's Internet... I steal it when the power goes out in my house. I already figured out the neighbor's password. (Colombia, 14, male)*

How Youth Search for What They Are Looking For

Participants indicated that searching for answers often still spans both online and offline media (including human resources), and that online and traditional sources do not necessarily present an either/or situation for them, but that they might use different sources for varying purposes. Participants mostly search for content that allows them to make informed decisions, solve a problem or question, and seems highly relevant to their lives. Social media plays a key role in participants' quest for answers. While social media features many content types, it is interesting to note that memes were highlighted by many as a key source of information. Further, all participants use search engines and treat a variety of platforms (e.g., YouTube and Wikipedia) as similar to Google Search. When searching for answers, participants pay much attention to visual media (i.e., pictures [such as memes or infographics] and videos), yet not enough became known about *how* participants search for visual and interactive content, including videos. Ending a search or quest depends not only on the finding of satisfactory results, but also on factors such as motivation, boredom, time limit, and being confronted with too much (often unreliable) information.

Interviewer: *When you search for things, Which sites or places do you use?*

Participant 1: *Google. (Uruguay, 14, Female)*

Participant 2: *I sometimes use books, especially for school. (Uruguay, 14, Male)*

Interviewer: *And to know what's going on around you. Where would you go for that?*

Participant 1: *TV. Daily news program.*

Participant 2: *TV. Me too.*

Participant 1: *And sometimes those news show up on social media.*

Interviewer: *Where do you search for information?*

Participant 2: *The one everyone uses, is Wikipedia. If you don't find something there, you have to adjust your search or search somewhere else like Google or YouTube. (Argentina, 15, female)*

Interviewer: *What do you search for online?*

Participant 1: *Drawing, tattoos, things about hairstyle. (Chile, 17, female)*

Participant 2: *How to play an instrument. (Chile, 16, female)*

Participant 3: *Things about my future. Careers. Well, not careers. But where I could study psychology, for instance. Because I'm not so sure what I would like to study. (Chile, 17, female)*

Participant 4: *Things for school. (Chile, 17, female)*

Interviewer: *What do you enjoy looking for online?*

Participant 1: *I'm always trying to inform myself about what's going on in the moment. For example, what laws are they trying to pass, or about the Amazonas. About what's going on right now so I can express a critical opinion, but in a correct way, not just the way I see it. (Chile, 17, female)*

Interviewer: *What types of information do you find most helpful and where do you find it?*

Participant 1: *I usually search for information on Google or Wikipedia. Also YouTube... To see videos from the point of view of an individual person. Or on Instagram, I check out comics and things like that... Things that are more visual. (Chile, 16, female)*

Interviewer: *Let's talk about the recent meteorite that hit the earth. How did you hear about it?*

Participant 2: *I learned about it when people started to create memes that were shared over social media. I then started to search for more information about it. (Colombia, 17, male)*

Interviewer: *What are the main difficulties you have when using the Internet? What kind of tasks or activities are harder for you to achieve or to understand?*

Participant 2: *When you search to do homework or something, you can get some information... but at the end, it may be wrong or fake. I really want information to be true, but it's really hard to find accurate information. So I often give up. (Chile, 13, female)*

How Youth Evaluate what is in Front of Them

On social media platforms like Facebook and Instagram, participants engage with content by scrolling through their feeds, exploring profiles of personalities, artists, communities, games, and companies they like. Language remains a barrier — content in English was stated as a challenge for some participants. YouTube, a platform where they look for information on topics of interest (vocational, music, health issues, and school, among others), is perceived as a particularly trustworthy space where information is more accurate. Great trust is placed into content that is presented as “step by step,” such as tutorials or classes that allow participants to learn at their own pace, ranging from explanations of mathematics to cooking recipes or tutorials on how to better play certain video games. More generally, participants state using a variety of cues and heuristics (e.g., usefulness, importance, relevance, believability, popularity, etc.) to determine the quality of information. For instance, several participants indicated distrust in information with an unknown or unspecified source. As an example, several participants mentioned Wikipedia as a platform where it is not sufficiently clear to them to what extent the creators of information are (in their eyes) experts / sufficiently qualified. Perhaps the most important cue for participants is that of visual and interactive elements. Participants say that they see graphics and multimedia not just as indicators of overall quality, but also as information objects which are open to quality judgments. Participants can see videos for themselves to make their own determinations, increasing participants’ perceptions of the credibility of information.

Interviewer: *Have you ever struggled accessing something? If so, why?*

Participant 1: *My teachers gave me some sites to explore but they were all in English and I didn't understand much. (Uruguay, 14, male)*

Participant 2: *Yeah. It happened to me in a game once. I tried to communicate with another person and the person spoke English. (Uruguay, 14, male)*

Interviewer: *How did you resolve the issue?*

Participant 2: *I didn't. We ended up not communicating.*

Interviewer: *You mentioned you like tutorials. Why do you like them?*

Participant 1: *I like to draw. So I look for videos that show me how to draw something step by step. It has to be very clear, precise, slow, and show that they truly know how to do something. Because otherwise I'm not able to do it. (Chile, 17, female)*

Interviewer: *How do you know if information is true or not?*

Participant 1: *The date of publication and the author. (Colombia, 16, female)*

Interviewer: *Are there any other ways?*

Participant 1: *If it has a logo.*

Interviewer: *What types of content do you like?*

Participant 1: *Information that is clear. That I understand. I also don't like it when what I'm reading is boring. You know. I like to engage with content that has drawings or illustrations. Things like that. However, I do read lots of books and those usually are text only. (Chile, 16, female)*

Interviewer: *If, for example, something is happening with your health or your body and you feel that it is complex to talk about it with your mother, do you look it up on the Internet and do you check who wrote it, for instance if it was written by a woman or a man?*

Participant 1: *If we are worried, we are not interested in who wrote it... I am not interested in knowing if it was written by a man or a woman but if it gives me the answer and I know what to do. (Colombia, 17, female)*

Interviewer: *Have you come across any sites that didn't seem reliable? If so, which ones and why?*

Participant 1: *Wikipedia. (Uruguay, 14, male)*

Interviewer: *Why don't you find it reliable?*

Participant 1: *Because anyone can add content to it. In fact, I have even written in Wikipedia.*

Interviewer: *Do you trust the information you find online?*

Participant 3: *I do not trust information on the Internet, it is mostly created by other people, and it can be deceiving. For instance, anyone can edit Wikipedia and add false content about any topic. If I want to find more reliable information, I try to check the news on TV, or go to the official website of an institution such as NASA. (Colombia, 16, male).*

Interviewer: *What content do you find most helpful?*

Participant 1: *I investigate things I want to learn or study in the future. I currently find gynecology interesting so every day when I come home from school I do research to see if I truly like that field or not. Yesterday I literally searched on YouTube "giving birth for real" to see everything in detail. (Chile, 16, female)*

How Youth Create and Share Online

Our data suggest that creating and sharing often takes place within the personal and social contexts. Overall few participants mentioned creating content, and even fewer in the context of a class or their education more broadly. Paying is not often a considered option when engaging with content online. Many participants report prioritizing free over paid content online. However, in a few cases participants expressed a certain level of appreciation for those who created the content, and some participants did say that they would pay for it (e.g., game) out of respect for the creators.

Interviewer: *Do you ever create or share content?*

Participant 1: *I do take selfies on Snapchat. I use Whats.App to share how I'm feeling... How my mood is. I share photos and videos through it. And for communication too. And I use Instagram and Facebook to check out stuff. But there I don't share or create much. (Argentina, 15, male)*

Interviewer: *Have you created a video?*

Participant 3: *I have. (Colombia, 16, male)*

Interviewer: *How do you usually make a video?*

Participant 3: *I create them on an app. I have to use several apps to create them. I create them on the cell phone and sometimes on the computer, I think it makes it easier on the cell phone because there are more applications I can use.*

Interviewer: *And what are the videos about?*

Participant 3: *Most of them are about video games. Teaching people how to play them. Also trying to overcome the world challenges that are out there.*

Interviewer: *And who taught you how to use those applications?*

Participant 3: *A cousin of mine who is a YouTuber. He taught me.*

Interviewer: *Do you ever share news?*

Participant 1: *If it has to do with family issues, then yes. Otherwise no. For example, I met a neighbor, her son, a soldier, was killed and there was a news item in the newspaper saying that they had to compensate the family for his death, but the police did not want to give anything and a fight started and so the family started to share that information so that people would support them. (Colombia, 16, female)*

Interviewer: *And where did you or they share that information?*

Participant 1: *On Whats.App and in this case they had a kind of pamphlet that they would give to people in the neighborhood for support and for sharing.*

Interviewer: *Okay and besides news like that, what else do you share?*

Participant 2: Memes. (Colombia, 17, female)

Participant 3: When there are strikes. When you are on the street, on the bus, and you see that they are doing a strike, you take a picture and send it. (Colombia, 16, female)

Interviewer: And where do you send it?

Participant 3: On WhatsApp to the family group because not everyone has Facebook.

Interviewer: Have you ever paid for content online?

Participant 1: I download mostly free content or I find ways to download it for free. (Uruguay, 14, male)

Participant 2: Yeah. I once paid for Minecraft. (Uruguay, 14, male)

Participant 1: Ah yes... I have paid for a game.

Participant 2: In some cases it's worth paying and in others it's not. Sometimes it takes a lot of work for someone to create a game and this person may want to get some money for the effort and that's why you have to pay.

Developing Skills

Participants with access acquire new skills mostly by themselves, across the personal, social and academic contexts. Participants learn using social media, playing video games, or engaging with information. Responses suggest that many skills are gained by trial and error and exploration over time. Participants tend to see their skills as practical and physical abilities that enable them to use or achieve something (e.g., knowing how to create a video or connect to the neighbor's WiFi) and more cognitive abilities (e.g., knowing how to differentiate between a useful and a not useful video). Social or emotional abilities that enable them to engage with others and the world more broadly (e.g., analyzing content from different points of view, sharing WiFi with friends and neighbors) — while key from an academic viewpoint — were expressed to a lesser extent, yet is likely due to the formulation of questions and the thematic foci. For instance, several participants highlighted the importance of creating something or applying a certain skill that may enable them to earn money and financially support their families. While practices from the personal and social contexts are often relevant to the academic context, they often clash with school norms and expectations. This complicates hopes of straightforward “skill transfer” or a “connected learning” approach. As for the intersection of gaming and informational dynamics, most participants mentioned learning how to play games on YouTube. There, participants find tutorials on winning strategies, and even instructions for how to ‘crack’ a game. Overall, YouTube seems participants’ go-to place to learn something new.

Interviewer: So who taught you how to use applications; you mentioned teachers, who else?

Participant 1: Ourselves. (Colombia, 16, female)

Participant 4: Ourselves. Mostly because there are so many students and not enough teachers. But there are also many tools we can use like video editors.

Participant 1: I have had Facebook since Facebook went viral. As one has it, one learns, because one instinctively wants to know what it's for. If this is what I need, what works.

Interviewer: So, you said you used YouTube to learn how to play guitar. Can you tell me more about that?

Participant 7: I look for a song that interests and for the sheet music and the scales. (Colombia, 17, male)

Participant 5: Many of us learn to play instruments like that. (Colombia, 16, male)

Participant 3: There is also a site called Songsterr, do you know it? (Colombia, 16, male)

Participant 5: Songsterr rings a bell, but I haven't looked it up.

Participant 3: They have sheet music for all the groups.

Participant 5: Oh, you can download them, yes.

Participant 3: You can look at them and pass them on, yes.

Interviewer: Did you find any difficulty or limitation in learning what you wanted to?

Person 1: I like the idea of taking courses at home, but I haven't able to because I don't have a computer. I always wanted to have a notebook. I could use it to be able to fix blocked phones, all that stuff and to help my family because the one who has the most problems with the phone in my house is my dad. So they don't need to spend money. (Argentina, 16, male)

Interviewer: Do you think it's challenging for teachers to include technologies in class?

Participant 1: There are many games designed to specifically learn something that teachers could use in elementary school. But for our age group, those games don't really work. We prefer challenging and exciting games that encourage you to learn something but more indirectly. At your own will. Without being a specific learning game. (Chile, 14, male)

Interviewer: Where do you go to learn something new? New knowledge or a new skill?

Participant 4: I currently use YouTube a lot to find recipes because I like to experiment at home. I also use it for beauty products, let's say homemade recipes, some hair care products. Also, right now I am experimenting with video editing. I have a program on my computer called Filmora, so I don't know how to use it perfectly but I use YouTube to learn how to use it and to upload videos. So I know how to use it halfway. I watch YouTube to know, to feed back my knowledge, to know about the subject. And it's been a little while now since I've been followed on my channel. So, the Internet is very important for making video projects because it tells you how you have to put it together. (Colombia, 17, female)

Discussion

Across all conversations we had, one take-away was most salient. Lack of high quality access — having consistent physical access to an Internet accessible device (e.g., smartphone, laptop, desktop computer), as well as the necessary technological infrastructure — remains one of the key challenges for most youth across all four countries.

Although participants inhabit geographic and sociocultural territories characterized by multiple social, economic, and educational challenges, the Internet — when accessible — provides them with a gateway to other possible worlds. Connecting to the Internet offers vulnerable youth opportunities to engage with different communities and spaces, and, to a certain extent, leave their current context (by, for instance, playing online games with peers all over the world), and engage in practices that are valuable to them and their lives. Moreover, by spending time on Internet platforms and engaging in digital practices youth are able to construct their identities, affinities, and relationships. These processes enable new modes of “being young” that shape not only youth social relationships but also their learning and education, providing new meanings, values, and discourses that are renegotiated and reappropriated in their particular contexts.

While studying youth and their engagement with the digital world at an individual level is important, it is also important to acknowledge that youth are one of several stakeholders (e.g., friends and family, teachers, coaches and mentors, companies, governments) that impact a young person's life. Youth relationships with others (e.g., friends/peers, family, teachers), the networks and communities they are part of, the resources and institutions they have access to (e.g., household, schools, libraries), and the policies and broader contexts that surround youth, all shape a young person's experience of the digital world.

Schools, for instance, can play a significant role in providing youth, especially those from vulnerable contexts, with access to digital technologies, as well as a somewhat more equitable way of learning digital skills. Further, schools not only offer formal spaces for learning and exchange (i.e., within the classroom) but also informal opportunities for students to exchange ideas, interests, and skills among peers. It is often at school that participants share new knowledge or information

(e.g., about a new game, the news, memes) such that their learning also goes through socialization, not only outside of school but with much relevance in their school environments.

In addition to schools, we would like to emphasize the importance of making (physical and virtual) informal learning spaces available to youth. Physical spaces — from maker spaces, creative teen spaces within libraries and museums, to computer clubhouses — can facilitate the exploration of specific interests and hobbies, as well as more youth creative endeavors not incorporated at school. Virtual learning spaces and communities may allow youth to explore completely new themes and interests, learn skills in meaningful and helpful ways, as well increase the potential of connecting with mentors, experts, or communities of practice one can learn from/with that are otherwise not available in close physical proximity.

Moving forward, observing and better understanding youth engagement with digital technologies will continue to help us understand youth lifeworlds as well as offer a source of inspiration for reimagining spaces and opportunities for creativity and learning that are central to youth and their relationship with the digital world, in terms of desires, interests and motivations.

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Youth Online and News: A Phenomenological View on Diversity

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As the amount of information consumed daily by young Internet users increases, researchers and policymakers have begun challenging conventional understandings of diversity exposure. Drawing upon findings from two mixed-method studies conducted in 2011 and 2013 by the Youth and Media project at the Berkman Center for Internet & Society at Harvard University, this article argues that a phenomenological approach to diversity that takes into account a broad range of developments in the digitally networked environment, including behavioral trends related to seeking, sharing, and creating information, might be a helpful starting point for discussing both the problems and solutions related to different facets of the diversity concept. Following the case study on youth interaction with online news, this article analyzes a spectrum of transformations: changing definitions of news, changes in news reading (such as new forms of participation, changing access modalities, and new types of gatekeepers), developments in social media practices, and emerging genres (such as memes). Throughout, this article discusses some of the conceptual challenges that emerge when applying current diversity frameworks to a real-world scenario and highlights complex behavioral patterns that should be taken into account before considering any interventions aimed at increasing diversity.

Keywords: diversity, information, Internet, news, online, social media, youth

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Introduction

Massive amounts of information are generated and shared over the Internet every day. Recent numbers illustrate the scale and speed by which the digital ecosystem continues to expand: every minute, users share 3,600 new photos on Instagram, upload 48 hours of video on YouTube, share 684,478 pieces of content on Facebook, and enter over 2 million search queries into Google (Spencer, 2012). At the same time, more people are making the Internet their information medium of choice. Eighty-five percent of American adults use the Internet to search for information, send or read e-mail, use social networking sites, get news, check the weather, look for information about politics, watch YouTube videos, do banking, and play games (Pew Internet & American Life Project, 2012). These statistics—a select few among many—suggest that the Internet has become an important reservoir of information and site of its actual usage. In combination with structural shifts in how information, knowledge, and entertainment are created, distributed, accessed, and reused, the aforementioned data points suggest that the Internet enables a wide dissemination of information from diverse and occasionally antagonistic sources.

Despite—or perhaps because of—these developments, recent debates among researchers and policymakers have raised concerns about the *actual exposure* of an individual user to a diverse set of information online. Theories about echo chamber effects and homophily and some supporting data give reason to be skeptical about the extent to which diversity of sources and content contribute to an environment in which individual users actually consume a diverse array of content (Benkler, Roberts, Faris, Solow-Niederman, & Etling, 2013; Zuckerman, 2013).

In light of these and related concerns, scholars and policymakers have started to map and examine various approaches for promoting exposure diversity in the digitally networked environment, which include a broad range of possible instruments and interventions, including a revitalization of public-service media, government-sponsored navigation aids promoting exposure to diversity by implementing diversity by design, and media literacy programs (Burri, 2012; Helberger, 2011; see the contributions in this article).

Concerns about exposure diversity and proposals aimed at increasing diversity deserve careful consideration. This article suggests that a *phenomenological approach* that takes into account a broad range of developments in the digitally networked environment, including behavioral trends related to seeking, sharing, and creating information, might be a helpful starting point for discussing both the problems and solutions related to different facets of diversity. To demonstrate the value of such an approach, the article focuses on one specific use case: youth online and news. This use case is appealing for several reasons. First, news is a particularly important category of information from a societal perspective, given its link to sound decision-making, civic engagement, and democratic participation (Costanza-Chock, 2012; Gil de Zúñiga, Jung, & Valenzuela, 2012; Lopez et al., 2006; Pasek, Kenski, Romer, & Jamieson, 2006). It is also heavily affected by the aforementioned structural shifts that occur as we move from an analog to a digital environment. Second, youth are a population that typically makes extensive use of digital technologies and often offers interesting insights into emerging practices and trends of seeking, sharing, and creating information (Gasser, Cortesi, Malik, & Lee, 2012).

Taking American youth online and news as a case study, this article seeks to add findings from surveys and focus group interviews conducted by Youth and Media at the Berkman Center for Internet & Society at Harvard University to current debates concerning source, content, and exposure diversity as defined by Napoli (1999, 2011). This article presents a brief overview of youth online and news, discusses the changing notion of news, and then focuses on changes in the news ecosystem, including new forms of participation, changing access modalities, and new types of gatekeepers. It then highlights recent developments in various news sources and examines trends in the diversification of social media platforms. The article discusses some of the conceptual challenges that emerge when applying current diversity frameworks to a real-world scenario and highlights complex behavioral patterns that should be taken into account *before* considering any interventions aimed at increasing diversity.

Method

This article draws on findings from two studies, conducted in 2011 and 2013 by the Youth and Media project at the Berkman Center for Internet & Society at Harvard University.

In the first study, 114 participants were included in 16 focus-group interviews conducted between May and December 2011 in Boston and New York City. Focus group interviews lasted for one hour each. Additionally, 38 participants were randomly selected to complete a questionnaire consisting of 26 multiple-choice questions about their online behavior and social media practices in particular. Participants ranged in age from 12 to 18.

The second study was conducted between February and August 2013. The Youth and Media team conducted 30 focus-group interviews with 203 participants in the greater Boston area, Chicago, Greensboro, North Carolina, Los Angeles, and Santa Barbara. Each focus-group interview lasted 90 minutes, including 15 minutes to fill out the questionnaire, which consisted of 20 multiple-choice questions and one open-ended response. Participants ranged in age from 11 to 19.

Although neither research sample was designed to constitute representative cross-sections of particular populations, the samples included participants from diverse ethnic, racial, and economic backgrounds. Interviews were structured but flexible; that is, interviewers were guided by a common questionnaire based on the research questions identified in Gasser et al. (2012), but they also had the flexibility to adapt questions according to emergent themes.

We selected the group interview method because group interviews reveal participants' differences of opinion and personal preferences (Frey & Fontana, 1991). Additionally, the method lends itself to this research because behaviors such as decision-making processes are inherently unobservable in a research setting but can be identified through individual participants' reflection, and the interaction between participants in focus groups allows comparisons between behaviors and preferences to be drawn during the interview (Morgan, 1997). Furthermore, the qualitative interview allows participants to reflect on what is often invisible to the interviewer: their feelings, emotions, and thoughts as they reflect on the process of search, evaluation, and creation of information online (Weiss, 1994). Modeling the work on Agosto (2002), the research team developed a coding scheme after iterative readings of the interview transcripts

and identified emergent themes. The first iteration yielded major themes, and successive readings focused on more specific topics. Given the size of the data sets, the research team employed the qualitative data analysis software NVivo to systematically analyze news information themes and other topics pertaining to information behavior online.

Youth and Online News

Data on youth access and consumption of news online are sparse, and even fewer data are available on more active user practices such as news creation and sharing. The state of research about adults' general news behavior online is slightly better.

These data indicate that 62% of online teens aged 12 to 17 consume news online, and these numbers tend to spike to 70% during election years (Lenhart, Purcell, Smith, & Zickuhr, 2010). Adults follow similar patterns: 61% of adults report that they get some kind of news online (Purcell, Rainie, Mitchell, Rosenstiel, & Olmstead, 2010), and 64% of voters under 30 name the Internet as a main source for election news (Pew Research Center for the People & the Press, 2012).

Additional data are available on the ways in which users access news in a digital environment. In a recent study by the Reuters Institute for the Study of Journalism (2013), 33% of study participants consume news on at least two devices. In particular, surveys indicate the increasingly important role of mobile devices such as smartphones and tablets for interacting with news: 62% of smartphone owners and 64% of tablet owners get news on their mobile devices weekly or more often. Users who consume news through their mobile devices spend, on average, at least 50 minutes a day getting their news online (Rosenstiel & Mitchell, 2012). And while one might assume that most mobile device owners would get their news on the go, 85% of tablet users and 58% of smartphone users say they tend to be at home (Rosenstiel & Mitchell, 2012).

Moreover, most Americans (92%) get news on a typical day via national TV, local TV, the Internet, local newspapers, radio, and national newspapers (Purcell et al., 2010). Almost half of the respondents of Purcell and colleagues' (2010) study use between four and six different media platforms to get news on a typical day, whereas just 7% get their news from a single media platform. Even though people report that they access their news via multiple platforms, many users (57%) routinely use the same websites for their news (Purcell et al., 2010). In addition to visiting their favorite news websites, users also rely on social media platforms and channels they trust to access news, with 75% of online news consumers getting news via social networking sites or forwarded through e-mail, 23% following news organizations or individual journalists on social networking sites, and 52% saying they share links to news with others via e-mail or social networking sites (Purcell et al., 2010).

In addition to the devices and platforms used to get news online, demographic factors are important variables that shape news behavior. For example, 66% of white youth search online for news and political information, whereas only 59% of Hispanic youth and 44% of African American youth search online (Lenhart et al., 2010). Also, older youth, those aged 14 to 17, are more likely (68%) to visit sites

for news or political information than younger youth, those aged 12 to 13 (49%) (Lenhart et al., 2010). Gender has no known effect on whether young people visit online news sites (Lenhart et al., 2010).

The Definition of News

The definition of *news* is becoming more complicated in the digitally networked environment (Downie & Schudson, 2009; Gillmor, 2006). On one hand, citizen blogs, aggregators, and eyewitness testimony delivered directly through social media (Allan & Thorsen, 2009) all fall outside the traditional model of a small number of large, professional journalism outlets acting as qualified gatekeepers and curators (Allan & Thorsen, 2009; Benkler, 2006; Paterson & Domingo, 2008). On the other hand, long-established professional outlets have been changing, with the newspaper industry in crisis (Pew Research Journalism Project, 2008; Picard, 2006), media organizations laying off long-form reporters (Weprin, 2012), and news outlets increasingly echoing one another's content (Boczkowski, 2010).

But the notion of what news is has not changed only at the systematic level. Perhaps even more important from a phenomenological viewpoint is that youth have an understanding of news that might be different from a traditional adult-normative perspective. When asked to explain what *news* meant to them, focus group participants offered a nuanced set of practices, understandings, and opinions. Rather than discuss news as a singular type of information, youth used a variety of framings. Several focus group participants understood news to be related only to politics or current events, which aligns with the systematic definition of news as information that empowers citizens to be active and engaged in their democracy and community (Downie & Kaiser, 2003).

Female (age 17): "It depends, but the first things that come to mind, for me, when you hear about news, is politics or political things like the government. And I think of the newspaper, because even news shows are not separate from gossip anymore." (2013)

Female (age 17): "All I can think about when I hear news is what I see on WGN [Chicago local news TV station]. Like political stuff, that's all." (2013)

Consistent with an empirical definition of news, most focus-group participants defined news very broadly, as referring to anything from breaking news about current events to learning about a friend's new relationship (Cortesi, Haduong, Gasser, & Beaton, 2013).

Female (age 15): "News doesn't have to be major, though—just something that needs to be told." (2013)

Female (age 14): "Well, news means to me, I don't know, updates. Things that are going on. Things that are going on around the world." (2013)

Male (age 17): "New games." (2013)

In many ways, the definition of news has changed and expanded in our digitally networked environment (Downie & Schudson, 2009). For instance, social media platforms refer to their stream of friend updates as a “news feed” (Facebook) or “feed” (Twitter, Tumblr), indicating to users that their friends’ postings can be thought of as news.

Female (age 14): “Anything that people post counts as news. ‘Cause everything shows up in your news feed.” (2013)

Male (age 16): “If it shows up in my news feed, it’s news to me.” (2013)

Moreover, participants frequently identified news to be an individualized concept.

Male (age 16): “Some people may see something as news and some may not.” (2013)

The changing notion of what news is, as evidenced in our qualitative studies, has a number of potential implications for the diversity debate. Conceptually, it illustrates how diversity frameworks might have to incorporate membranes aimed at ensuring interoperability among perspectives and notions of blurring content categories such as news—for instance, between an adult-normative perspective and an ethnographic (here, youth-generated) perspective. These differentiations are not merely semantic; they also affect the diversity analysis. At the practical level, for instance, a broader understanding of what constitutes news is likely to impact our evaluation of source and exposure diversity (positively), as it broadens the spectrum of sources from which youth can gather information, and it broadens their willingness to engage with diverse information.

Youth Activity in the Changing Online News Ecosystem

Recent research on youth online and news highlights youth’s strong tendency to take advantage of opportunities for content sharing and creation (Lenhart et al., 2010) and options for the broader expansion of interactivity (or the shift toward social production) across the information ecosystem (Benkler, 2006). In particular, the range of online tools and techniques through which youth access news is expanding. Across these activities, new types of gatekeepers have entered the arena, especially when considering social media platforms such as Facebook and Twitter. Structural shifts and behavioral trends in the news environment suggest an increased interactive and iterative relationship among elements such as source, content, and exposure within current conceptualizations of diversity as described in the literature (Napoli, 2011).

Participation and Content Creation

In recent years, the news landscape has become more complex as a growing number of highly interactive news sources, including social media platforms (e.g., Twitter, Reddit), citizen blogs (e.g., CNN iReports), and user-generated online news platforms (e.g., YouTube, PolicyMic) have emerged. Many of these platforms and some traditional news sources’ websites include room for comments and discussions, creating an easily accessible space for participation in the news ecosystem.

In this increasingly interactive and social information ecosystem, creating and sharing information have become central activities of youth online, particularly on social media platforms. For example, 86% of teens who use social networks also report posting comments to a friend's page or wall on a social networking site (Lenhart, et al., 2010). Although adults commonly share small bits of information on social networking platforms (Junco, 2012; Lenhart et al., 2010; Madden, 2010), youth report additional forms of information creation and sharing that encompass a wider range of practices, such as creating video; writing blogs; remixing photos, videos, and music; writing fan fiction; participating in role-playing communities; writing news content for online publications or outlets; and a plethora of other content-creation activities (Junco, 2013; Madden et al., 2013; Ólafsson, Livingstone, & Haddon, 2013). The rate of youth content creation appears significantly higher than that of adults in the United States, with more than a third of youth (38%), compared with 30% of adults, sharing content they've actually created themselves (Lenhart, et al., 2010). One out of five teens (21%) remixes content created by others, and 14% of teens blog, compared with 15% and 11% of adults, respectively (Lenhart, et al., 2010).

For example, youth participants in our focus groups reported using Instagram, Tumblr, and Facebook in a variety of creative ways beyond simply posting pictures or status updates.

Female (age 15): "I use Textgram, where you put lyrics under your pictures in Instagram. When I'm on Pandora, and Pandora is playing all of my hits, I screenshot my Pandora Station." (2013)

Female (age 18): "The reason I made a Tumblr was so I could upload my book. It's linked with my Twitter, and I would hashtag Mount Everest and adventure stories, so it got me in contact with a bunch of publishers and mountain climbers." (2013)

Female (age 16): "On Facebook, you could like my status for a shout-out video. At the end, whoever likes your status, you've got to make them a little video and tell them how you feel, and then you tag them in it." (2013)

There is very little research on youth news creation available, but anecdotal evidence suggests that at least a portion of youth's content creation and sharing practices are related to news, particularly when one takes into account youth's broadening understanding of what news means (see above). Aggregated data on news-related and interactive practices on social networking platforms illustrate the phenomenon. For instance, Barack Obama's victory post on Facebook was the most liked photo in 2012, with over 4 million likes (Honigman, 2012). On Twitter, the 2012 election's 31.7 million political tweets broke records; Election Day was the most tweeted-about event in U.S. political history (Finn, 2012). Users of Instagram (a platform that is particularly popular among teenagers) uploaded more than 800,000 photos of Hurricane Sandy tagged with "#Sandy" (Markowitz, 2012). These examples suggest that many users of social networking sites are engaged in interactive news practices, including content creation, news sharing, and commenting on news.

Female (age 16): "Twitter's good if you can't go to one of the school games. If you went to the soccer game instead of the lacrosse game, or vice versa, then generally there's a tweet about who won, and the score. And it's not even just with school games. The ACC [Atlantic Coast Conference] is going on right now, so all the guys are tweeting about that." (2013)

Youth's widespread adoption of sharing and creation techniques has several implications for notions of diversity. At the conceptual level, increased interactivity suggests that traditional categories such as producers, distributors, and recipients are blurring when applied to youth and news online. Viewed from this phenomenological angle, diversity models will have to take into account the interactive relationship between what has previously been labeled the audience, as part of exposure diversity, and nontraditional co-creators of news, as part of source diversity. As youth are no longer only consumers but also co-creators and sharers of news, traditional notions of source and content diversity now might take into account demographic or ethnic diversity outside the familiar dimensions of organizational and economic structures of professional media companies.

Push, Pull, and Everything in Between

When applied to the news ecosystem, diversity frameworks, approaches, and policies must also take into account the changing modalities in which news is accessed. Opportunities to access the news have increased as digital devices have multiplied among youth: 82% own at least one mobile device; 78% of youth own a cell phone, 47% of whom own a smartphone; and 25% of all youth have a tablet (Madden, Lenhart, Duggan, Cortesi, & Gasser, 2013).

Female (age 13): "If you're not at home, but you have your phone, you can keep up with the [sports] game. And then you're like, okay, I'm doing good." (2013)

Traditionally, to access information, consumers "pulled" news from sources. In such a scenario, a consumer must actively choose to read a newspaper, watch a television program, or navigate to a news website. On electronic devices, however, users now have the option of receiving "push" notifications about information that may be interesting or relevant to them individually, even if they do not immediately access the app. Many focus group participants reported having installed *The New York Times'* app, which pushes breaking-news alerts to users, contributing to a news landscape where mobile device users can automatically receive news. This trend of happening upon or stumbling upon news occurs on various other online platforms as well, occasionally without users even being aware of the phenomenon.

Female (age 15): "Yeah, I'd say I use the Internet mostly for school and social. I don't really look at the news. I use the TV for that, or my parents tell me. But I'm definitely on Facebook, Gmail, Skype, ooVoo, and YouTube all the time." (2013)

Though this participant—using a narrower definition of *news*—specifically stated that she does not look at the news, she probably still gets news through several of the online services that she mentioned using regularly, particularly through her Facebook news feed or YouTube's Most Viewed. For example, in

2011 and early 2012, a news-related event was the most searched term on YouTube for five out of the 15 months, according to YouTube's internal data (Pew Research Journalism Project, 2012).

Female (age 12): "Usually our teachers, like, I will see people post a lot on Facebook about it, and then I will go on YouTube, and sometimes if there's a big event that happens, it'll be at the top of the YouTube page." (2013)

The changing access conditions that focus group participants described—including the move to accessing news sources via mobile devices—are likely to have long-term implications for exposure diversity. While the net effects of the growing number of connection points through which youth access news remains to be studied in greater detail, early indicators suggest that apps on mobile phones with breaking-news alert systems, in tandem with social networking sites' push notification schemes of, have the potential to increase youth exposure to at least the headlines or leads of news stories from a relatively diverse set of speakers and sources. Furthermore, youth usage of a growing portfolio of nontraditional and interactive news platforms, including Facebook, Twitter, and YouTube, has interesting theoretical and practical implications for both source and content diversity, including emerging issues such as the power of algorithms that determine what appears in news feeds and questions about platform demographics in the case of user-created content.

Information Gatekeepers

Research on youth online and news practices makes visible the emergence and importance of new types of information gatekeepers, particularly on social media, that might have a significant impact on source and exposure diversity. In the traditional news ecosystem, a relatively small group of professionals organized in hierarchically structured and typically commercial news organizations served as information gatekeepers. Since the disruptive transition to a digitally networked news environment, such traditional source-side gatekeepers tend to be less important (although websites and platforms such as NYTimes.com, WashingtonPost.com, and WSJ.com still operate in accordance with more traditional concepts). Rather, new intermediaries such as search engines and information aggregators with opaque algorithms are playing an increasingly important role in shaping what news youth are exposed to online (see below), blurring the lines between issues previously associated with source, content, or exposure diversity. Other platforms, such as Facebook or Twitter, are mostly left unedited and unmoderated, drawing content from the recommendations and postings of friends (Zuckerman, 2013).

As new institutional intermediaries have emerged, individuals on social networking sites have started to play an increasingly important role in determining youth's exposure to news. According to Cohen and Kahne (2012), 45% of youth get news at least once a week from friends and family via Facebook or Twitter.

Interviewer: "If a big event happens, where would you find out?"

Female (age 14): "My dad. He usually reads CNN on his iPad a lot." (2011)

The effects of the transition away from traditional source-based information gatekeepers toward powerful algorithms and peer recommendations on youth's news interaction patterns and exposure to diverse content remain to be studied. Scholars have not reached a consensus on whether the use and structure of social media lead to a broader or narrower exposure to diverse perspectives, as compared with traditional offline sources of news (Zuckerman, 2013). Some observers argue that social media users are immersed in ideologically uniform information from narrow perspectives because the new social media gatekeepers are individuals the user has chosen as "friends" and because people tend to create networks out of other like-minded people (Kossinets & Watts, 2009; McPherson, Lovin, & Cook, 2001; Zuckerman, 2013).

Other research suggests that sharing behavior may still open new possibilities for contact with diverse lives, stories, and perspectives. Individuals with a passion for a particular cause, region, or issue may become opinion leaders who expose their networks to news that would otherwise fall outside of their typical reading habits (Zuckerman, 2013). In a study of 253 million Facebook users, Bakshy, Rosenn, Marlow, and Adamic (2012) found that although users are more likely to share links from their closest Facebook friends—their strongest ties—they still share many links with their weakest ties (the majority of the people in users' Facebook networks are considered by the authors to be weak ties). Because these numerous weak ties are responsible for the majority of novel information that users see and reshare, this research indicates that Facebook may not be as much of an echo chamber as the concept of homophily might suggest.

Portfolio of News Sources

From a diversity perspective, news is a particularly interesting use case with respect to the question of *where* users look for information. Recent data on adult news consumption show that the number of news sources the average user accesses daily has increased (Kohut, Doherty, Dimock, & Skeeter, 2012). In an effort to gather data on youth practices, we asked study participants to identify one or more sources where they find news. The results are summarized in Figure 1.

At least three aspects from this survey in the thematic context of diversity are worth highlighting. First, the survey suggests that the distribution of news sources varies across categories of news. Some of the sources are more traditional, but others are nontraditional, such as Twitter or Facebook. Focus group interviews confirm that youth select news sources based on information needs, type of news, and context (e.g., time constraints). Second, the results corroborate data from other sources (Kohut et al., 2012) about the prevalence of TV as a news source. Finally, offline news sources such as parents and friends play a role as well. While not statistically significant, respondents' mentions of parents as news sources in interviews occurred frequently in the contexts of politics and breaking news.

Where do you find the following information? Please mark all the appropriate boxes.

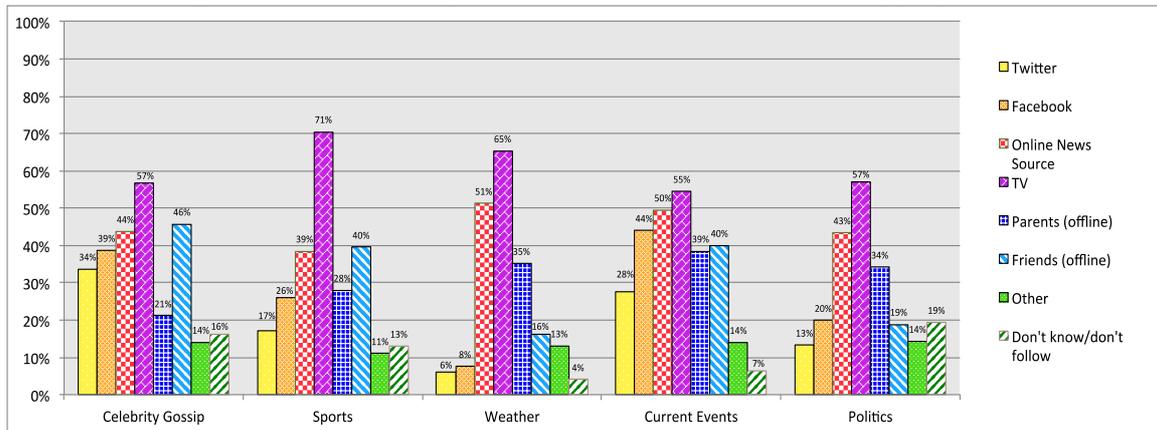


Figure 1. Where U.S. Focus Group Participants (Ages 11–19) Find News (N = 201).

Source: 2013 data from the questionnaire administered by the Youth and Media project at the Berkman Center for Internet & Society at Harvard University.

As far as the online news ecosystem is concerned, search engines— which youth use widely (Bilal & Ellis, 2011; Rowlands et al., 2008)—have leveled off as a news source at 33% of Internet users. A recent survey (Kohut et al., 2012) suggests an increased relevance of news sites like Google News, Yahoo! News, and CNN.com, a finding that our focus groups confirmed:

Male (age 16): “Like, I don’t really read newspapers, but on the Internet you can just go to CNN.com and get information about everything.” (2011)

Youth also find news through online news aggregators and by having news stories pushed to them on mobile devices from traditional outlets such as *The New York Times* (Kohut et al., 2012). Many youth seem to enjoy the social dimension of news obtained through social media platforms such as Facebook, YouTube, and Twitter (Kohut et al., 2012; Rainie, Hitlin, Jurkowitz, Dimock, & Neidorf, 2012), a phenomenon that will be discussed in greater detail in the next section. Focus group participants also described the ability to choose the type of news they received as important.

Female (age 14): “I’m always on Facebook. And occasionally, I go on Twitter, but that’s more for celebrity stuff, because they’re more direct on Twitter. So, that’s kind of helpful if you want to find out exactly what this person—this is going to sound kind of creepy, but—where they are, and how they are. How they’re doing and what they’re up to. That’s easier for celebrities, but for my friends, I use Facebook.” (2011)

Female (age 15): “You get to choose what you hear on Twitter and Facebook, because you follow certain friends. But, on the news, they inform you about everybody.” (2011)

Breaking news is an interesting example that shows how traditional and nontraditional news sources might play together for youth. Focus group participants reported hearing about breaking news stories from several sources: established news outlets' websites (e.g., NYTimes.com, CNN.com, BBC.co.uk), social media (e.g., Facebook), and friends or family, who in turn often received the news through online sources.

Male (age 14): "When I want to find something out, I log on to my computer, and I go to see Chicago breaking news."

Interviewer: "But where do you find out about breaking news?"

Male (age 14): "I find it out on Facebook, of course!" (2013)

Female (age 13): "Well, any kind of event really hits Twitter really fast, and everyone spreads it. And everyone finds out, like, the second it happens, or even before." (2011)

Participants frequently reported discovering breaking news by reading posts on social media platforms. However, no matter what source they found first, youth said that they consulted additional sources to learn more about the news story or to verify the information.

Female (age 14): "On Facebook, I heard that Jackie Chan was dead. And I had to go look that up and see if that man was dead."

Interviewer: "So you have to verify the information you see on Twitter and Facebook?"

Female (age 14): "Yeah. Often I do. But if it's very new information, it's sometimes hard to find out if it's true or not." (2011)

In sum, recent research on youth's information behavior shows that youth get their news from a *broad variety of sources*—offline and online, traditional and nontraditional. From a diversity perspective, it is important to understand that youth use different sources in a range of options depending on their information, the type of news (e.g., weather, celebrity gossip, sports.), and the context (e.g., time constraints, social setting). This news-seeking behavior illustrates how nuanced today's digital news ecosystem is from a young user's perspective and that it is factually complex to a degree that is not easy to incorporate into theoretical models of diversity.

Social Media Practices

As noted in the previous section, social media have become relevant sources of online news among youth. Facebook continues to play an important role in youths' lives despite a trend toward platform diversification (Madden, 2013). In broad terms, focus group participants see Facebook as a source that informs them, sparks their interest, or makes them aware of the occurrence of a particular news event.

Interviewer: "For example, if you think about a recent event that happened, how would you usually find out more about it?"

Male (age 13): "Facebook." (2011)

Other participants confirmed that Facebook often fulfills a primarily social or interest-driven purpose but also introduces them to news-related links, articles, videos, and other information. One youth directly pointed to the diversity of types of information that might be shared nearly simultaneously on Facebook:

Female (age 13): "On Facebook you can just post a quote or make a lyric from your song and people will see it. But you can also say what happened." (2011)

Some participants also explained that using social media is a useful way to learn about what is happening in their communities. One participant felt that social media could be even more reliable than traditional news sources:

Female (age 17): "The other day in my neighborhood, someone got shot. And before it got to the news, someone put it on Facebook. So I do think it often gets on social media before it's in the news. Also, the news doesn't show everything. They leave stuff out. And the news often doesn't get stuff right."

Interviewer: "And on Facebook people do?"

Female (age 17): "Yeah. 'Cause on Facebook there are people that maybe were involved or knew the people. Those people really know what happened." (2013)

Several focus group participants highlighted the timeliness of information shared over Facebook or Twitter as a key feature of social media platforms as news sources.

Male (age 17): "I think the fastest way to find out something is both Facebook and Twitter. For example, when Jerry Buss [Los Angeles Lakers owner] died, everybody was tweeting and everybody was on Facebook about it. . . . It just shows up based on your friends." (2013)

Because of the speed at which information is shared on social media platforms, youth can even become the first recipients of news about an important event, as one youth told us:

Male (age 13): "In my house, I was the first person to find out about Steve Jobs' death because I saw it on Facebook, just a friend commenting. That was like the first time I heard about it, and yes, I guess everything happens really quickly." (2011)

Recent research indicates that the general finding that youth select traditional news sources based on the type of content they desire also applies to social media platforms. One study on Twitter, for instance, found that "interest in entertainment and celebrity news is an especially strong predictor of site adoption" (Hargittai & Litt, 2011).

In our focus group interviews, we spoke to youth who use Twitter to follow their favorite bands, sports stars, or other figures in popular culture, with several youth actively participating in the Twittersphere.

Female (age 18): "I follow a bunch of music on Twitter. I have this internship at another school and I follow their Twitter page and a bunch of other organizations I work with. It's good for keeping you updated. And hashtags are really fun—I love hashtags." (2013)

As already noted, youth perceive Twitter to be a platform over which news spreads very quickly, as the following focus group quotes illustrate:

Male (age 17): "I follow sports teams, politics, and yeah, for news, because it's just faster." (2013)

Female (age 13): "Any kind of event hits Twitter really fast, and then everyone just spreads it." (2013)

Although youth's primary motivation for using Twitter may not be driven by the need to stay on top of current news events, the broader social circle of public figures Twitter connects them to may lead to unanticipated or initially unintended news exposure.

From a diversity perspective, the rise of social media as news sources is a fascinating and currently underexplored phenomenon with potential implications for exposure diversity. As noted above, scholars generally disagree on the diversity effects of social media, with studies pointing in both directions (Benkler, 2006; Hindman, 2007; Napoli, 2011). While the effects of social media on exposure diversity remain contested, our research highlights a second phenomenon worthy of further exploration (Madden et al., 2013): as mentioned above, youth not only maintain portfolios of various types of news sources but are also diversifying their social media platforms (Madden, 2013). To what extent this trend toward platform diversification might ultimately shape not only source diversity but also content diversity (because news shared over Facebook tends to provide different content, timeliness, relevance, and other factors from Instagram, Twitter, or Tumblr) remains an open research question.

Popularity of New Genres

The increased popularity, heterogeneity, and persistence of memes as a genre through which youth contribute to conversations about current events, politics, and other news is another diversity-relevant phenomenon that emerges from our case study on youth online and news. Internet memes, such

as the images in Figures 2 and 3, are viral media objects that tend to be humorous imitations of some product or concept (Shifman, 2013). They can present themselves in the form of an image, hyperlink, video, picture, website, or hashtag, and they often spread through iterative versions instead of exact copies.

Although memes can appear to be silly and irrelevant from an adult perspective, they can also function as a form of civic engagement, particularly participation in the news ecosystem.

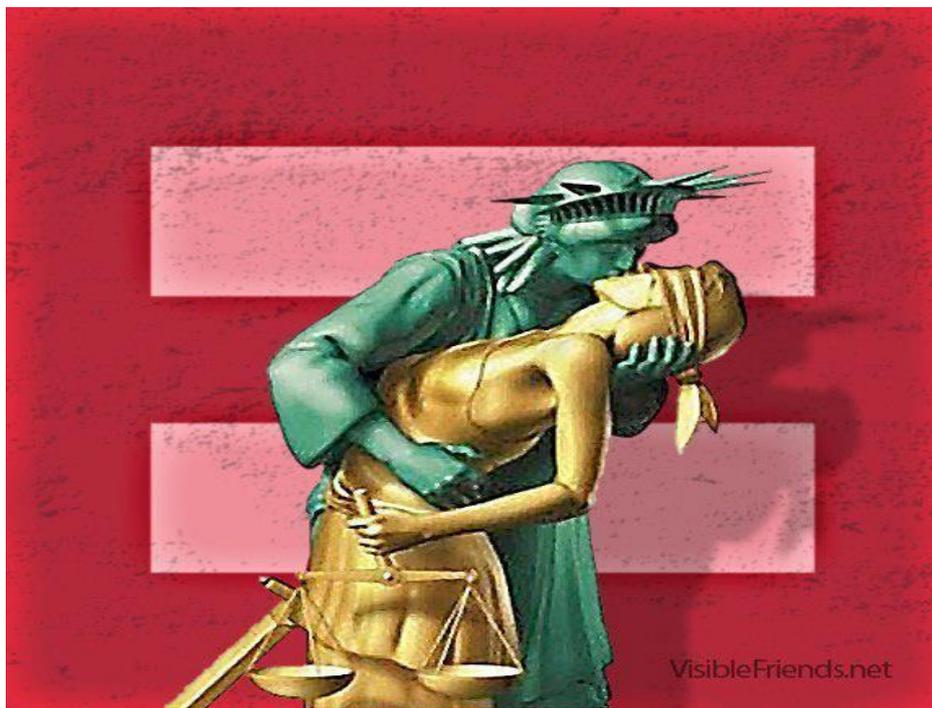


Figure 2. DOMA in the Supreme Court.

Source: KnowYourMeme.com

Figure 2 is a reference to *United States v. Windsor*, a landmark Supreme Court case decided on June 26, 2013 (United States v. Windsor, 2013). In the days leading up to the decision, many Facebook users changed their profile pictures to a variation of this meme, riffing on the Human Rights Campaign logo (Kolodji, 2013). Figure 3 is a reference to the gun-control debate that emerged immediately after the Sandy Hook Elementary School shooting on December 14, 2012 (Know Your Meme, 2013; The Sandy Hook Project, 2013; Trotter, 2013).

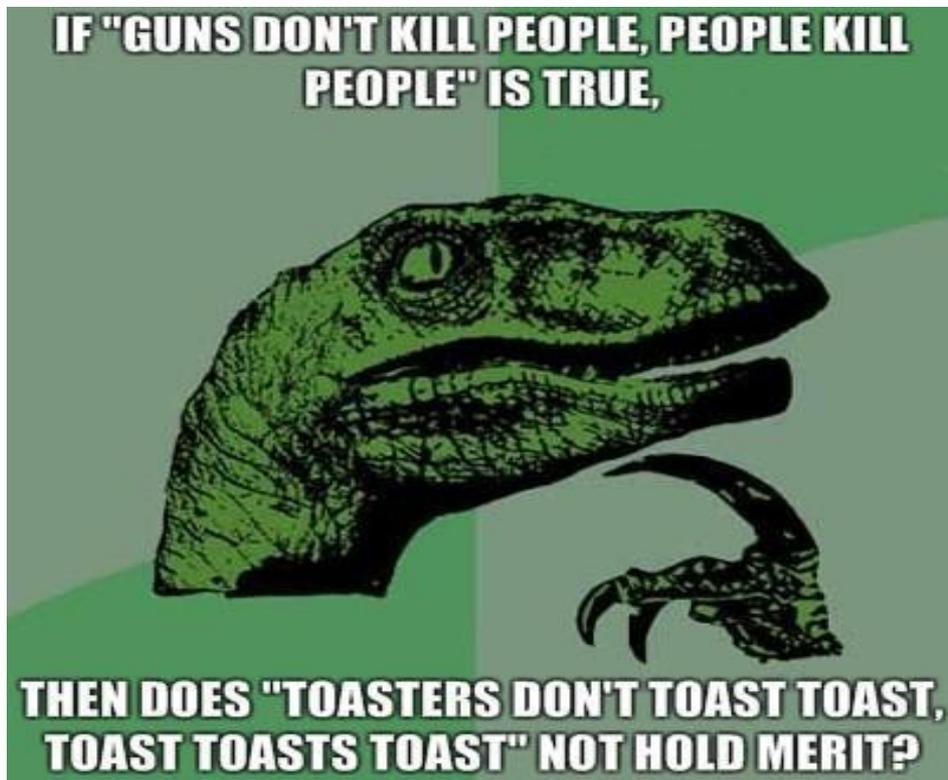


Figure 3. Philosoraptor on Gun Control.

Source: KnowYourMeme.com

Memes can spread and evolve rapidly and in unexpected ways across social and cultural boundaries (Buchel, 2012). The Internet is particularly well suited for large-scale meme distribution, as it has three key properties that Dawkins (1989) introduced in his work on memes: (a) high copy-fidelity (accuracy), because digitization allows for information transfer without loss; (b) fecundity, as many more copies of a meme can be made per time unit; and (c) longevity, because information can be stored indefinitely in archives. Additionally, the Internet transcends national boundaries, so theoretically, it should allow for the transnational spread of successful memes (Shifman & Thelwall, 2009). The massive heterogeneity in the popularity and persistence of memes can be explained by the combination of two key factors: competition for limited attention, and the structure of social networks (Weng, Flammini, Vespignani, & Menczer, 2012).

By creating and remixing memes using websites such as memegenerator.net and quickmeme.com, youth produce highly contextual, humorous, visual, and easily digestible news content

and social commentary. Based on recent surveys and our focus group work, we hypothesize that memes are one way in which young people participate in dialogue about current events, politics, and news information.

Male (age 16): "Memes give you an idea. It's kind of like putting a serious topic into a comical way. When they legalized marijuana, they had a picture of fog everywhere and they put, 'The next day . . .'" (2013)



Figure 4. Colorado Marijuana Legalization.

Source: WeKnowMemes.com

The example of meme production illustrates one of several means through which youth not only have become creators and advocates of topics of their interest but also have shaped the online news ecosystem and the notion of what constitutes news. Youth post their opinions on social media, share articles they like, and engage in more creative forms of online news creation, such as memes. In fact, memes emerge as an additional content category complementary to more traditional formats, such as those available via news sites such as NYTimes.com. Youth who access, create, and share memes with their peers do so through social media platforms or meme-aggregating websites such as www.knowyourmeme.com. While the long-term effects of such creative and news-relevant practices remain to be studied in detail, it seems safe to say that they are likely to affect at least some of the facets of source, content, and exposure diversity.

Conclusion

This article offers an alternative view on current policy debates and underlying concerns about the diversity of our information ecosystem. Taking the notion of exposure diversity seriously, this article offers a concrete use case focusing on ways in which youth engage with news online as one particularly important category of information. Building upon findings from recent surveys and focus group interviews, the article sketches the contours of an impressively diverse news landscape from a youth perspective. Youth access news through a broad range of offline and online sources, including both traditional and new media, depending on their information needs, the type of news, and context. In addition, youth actively engage with news as sharers, co-creators, and commentators because of the new possibilities for engagement afforded by the Internet and social media platforms. Participation in the creation of news and news commentary has increased, while the spectrum of information objects that can be considered "news" has broadened. Together, these behavioral trends—mediated by an increasingly diverse portfolio of social media platforms—suggest a highly complex and fluid news ecosystem.

More specifically, and using Napoli's (1999) diversity framework, the following insights into diversity from our use case on youth online and news seem worthy of consideration:

- *Source Diversity:* Interview findings and survey data show that youth access news through a broad range of online and offline sources, including parents, friends, TV, news websites, and social media, depending on the type of information they seek and the context in which they interact with it. TV, for instance, is the preferred source for sports news, while Twitter is often used to reach celebrity gossip and entertainment news. Social media platforms play an important role as news sources because they support personalization and make news more relevant and interesting for youth. Another driver for social media as news sources is the speed with which news, particularly breaking news, spreads, although youth are wary of whether the information is accurate, and they report to confirm stories using multiple sources. Across these activities, youth not only maintain a rich portfolio of traditional and nontraditional news sources but also diversify their social media platforms.
- *Content Diversity:* At the most fundamental level, our research suggests that the notion of what constitutes news is in flux. Rather than think of news as a well-defined type of content, youth in focus group interviews refer to anything, from current events and celebrity gossip to sports and weather, as news. This broadened understanding of news has important implications with respect to how often and where youth access news. When we asked youth about a particular incident or breaking news (e.g., President Obama's re-election), it became clear that they typically used multiple news sources and various news formats. Youth often perceive creative news genres such as online memes as more contextual, humorous, visually appealing, and digestible than traditional content shared over sites such as NYTimes.com, and thus these genres might affect what youth access and share. While recent youth news practices give reason for cautious optimism, to what extent the diverse portfolio of news sources and platforms youth use ultimately translates into content diversity remains an open empirical question.

- *Exposure Diversity*: The ways in which youth are exposed to online news are evolving. The modalities of exposure change as we transition from an environment where we pull information from traditional news sources toward a more flexible ecosystem where we include receive push notifications from smartphone news apps or where we happen upon news articles in our Facebook news feeds. Our findings suggest that youth are widely utilizing opportunities to actively interact with digital content—by commenting on news, sharing it with friends, and the like. In many of these instances, youth not only encounter a broad range of important issues but also use creative digital forms to contribute directly to online discourse, as the examples of community news and meme creation illustrate. Overall, our findings support the proposition that young users' online news behavior is best understood as a complex and iterative process involving practices of seeking, sharing, and creating news information, with potential consequences for the framing of exposure diversity.

This article cannot answer the question of whether legitimate concerns about source, content, and exposure diversity are more or less pressing in the digitally networked environment, and it does not seek to draw conclusions about the promises and limitations of potential interventions aimed at increasing diversity at large. However, it does argue that any debate about diversity—especially exposure diversity—is likely to benefit from an in-depth exploration of the nuanced behavior of actual users in any given context. Taking youth online and news as our use case, this article builds upon recent survey data and focus group interviews to call attention to some of the conceptual challenges of applying current diversity frameworks to real-world scenarios and to highlight complex behavioral patterns that should be taken into account before considering any interventions aimed at increasing diversity.

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Youth and Participatory Research: Opportunities and Challenges from Academia

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Abstract

Many young people are eager to help make critical choices that will help determine what kind of world we create with and for them. To what extent, and through what processes, should young people (ages 12-18) be included in the research process? We hold that incorporating the youth voice is essential in developing research that results in educational programs and policies that are relevant and meaningful to young people — particularly those youth from underrepresented communities. While the literature base indicates, at least in certain areas, a trend towards increased youth participation, there is a need for greater youth engagement in the research process. In this paper, we seek to highlight the fields that youth participatory research is more prevalent; the benefits of participatory research for youth, adult researchers, and organizations; examples of how our team has engaged in this form of research; and the opportunities and challenges such research has presented in our work. We envision that our efforts in the participatory research space may help offer both a theoretical foundation and a practical illustration of how youth voices and perspectives can be incorporated into critical research areas which, in turn, can inform policy debates about the future of an increasingly digitally connected environment.

Introduction

When we started to study young people and their engagement with digital technology, there were already a good number of very established researchers and research teams focusing on the same topic. And so we came to question how we could differentiate the work we do from what already existed and conceptualize and refine the frameworks and methodologies we use for greater impact. And while, over the course of our research, we have applied a number of different practices, one key aspiration remained the same. Namely, to not only center our efforts and do research “about” or “for” young people but, more importantly, “with” young people — a push for meaningful youth participation at all stages of the research process. We followed two main rationales: the “ethical” grounds that youth have a right to be involved in the research and presentation of their own lives, aspirations, and struggles; and the “instrumental” grounds that it is only through working with youth that we can gain the most accurate (and unexpected) data — unmediated and untainted by our adult presuppositions and objectives — and create meaningful solutions.

Cultivating meaningful youth involvement at all stages of the research process has raised a number of interesting conceptual and practical questions, including:

- How can we not only see young people as research participants or objects of study but, instead, find ways to include them as research partners?
- How can an equitable and collaborative partnership between those who see themselves as researchers and youth be built, suggesting shared participation and decision making throughout the whole research process?
- To what extent can the research process itself be co-designed (vs. operating in predetermined processes)?
- What knowledge and skills are required to truly see and be seen as a partner when identifying research goals, defining research topics and questions (according to participants' lived experiences), designing and conducting research, engaging in data analysis (e.g., discussing what specific results could be interpreted, collaborating on how the collection of participant experiences, perceptions, and suggestions could be effectively represented), and participating in output creation and dissemination?
- What are the power dynamics inherent in the adult/youth relationship? What role and relevance do power structures play? And in which ways do power structures allow, prevent, or suppress the participation of young people?
- How can participatory research, as a method of social science research, best interact with the methods of community organizing and youth organizing groups? And as academics, how can we best deal with the tension of wanting a rigorous methodology to advance research, while those we partner with (e.g., schools, community organizers, activists) are often more focused on developing campaigns and mobilizing.

Despite the challenges these questions highlight, we became an avid advocate of “participatory research.” In this paper, we would like to share some of our observations of the process itself, and to demonstrate its validity in terms of knowledge production and advancing the field of youth and digital technologies studies.

From Challenge to Opportunity: Inclusion of Youth Voices and Perspectives

Some say that participatory research — sometimes called participatory action (i.e., after studying an issue, together actions/interventions that align participants' needs and interests are developed), research, community-engaged research, participatory research and action research — represents a (radical) research method, while others consider it a research style or strategy, a re-envisioning of whose knowledge is valuable and valued, or a tool of decolonization (Bergold & Thomas, 2010; Groundwater-Smith et al., 2014; Mirra et al., 2015; Rodríguez & Brown, 2009). In essence, participatory research aims to include people as research partners rather than research participants or objects of study. Participatory research values and reflects the creative and analytic abilities found in participants for whom the studied phenomenon is a daily lived experience (Anderson et al., 2015). Participatory research proposes an equitable and collaborative relationship between those who see themselves as more traditional (academic) researchers and members of a community (e.g., youth, people from underserved communities, specific ethnic/racial groups, people living with health issues), suggesting shared participation and decision-making throughout the whole research process (Jacquez et al., 2013). The research process spans from identifying research goals, defining research topics and questions (according to participants' lived experiences), designing and

conducting research, engaging in data analysis (e.g., discussing the interpretation of specific results, collaborating on how the collection of participant experiences, perceptions, and suggestions could be effectively represented), and participating in output creation and dissemination.

There are some research areas where participatory research with “adults” is relatively common. Particularly in research focusing on health and underserved communities, researchers have highlighted the importance of engaging directly with individuals with specific inside knowledge instead of focusing on outside expertise (Jacquez et al., 2013).

Participatory research with youth involves young people in the construction of new knowledge by defining, studying, and addressing issues and questions — centered on youth expertise — through youth–adult partnerships (Cammarota & Fine, 2008; Checkoway & Richards-Schuster, 2003; Jacquez et al., 2013). Participatory research with young people is still very rare, some of the better-known examples involving youth are from the pediatrics field, where age, amongst other factors, can create clear discrepancies between adult researchers and young patients. More specifically, participatory research with youth has been applied in areas such as mental health, cancer and HIV research, and health intervention development (Carman et al., 2013; Ennis & Wykes, 2013; Powers & Tiffany, 2006; Rosenberg et al., 2016). However, in most cases, youth are often viewed as more passive contributors (i.e., discussing research questions and outcomes) rather than co-leading research projects themselves (Tsang et al., 2020). At X, applying a participatory research approach has meant a significant shift in how we have conducted our day-to-day work. On a daily basis, we have engaged very closely with young people and have empowered them to learn research skills so that they can formulate their own research questions and action plans. Collaboratively, we have collected data through interviews, social media posts, and other, more participatory formats. Together, we have studied the data and have co-written outputs that our team and the young people we work with were excited to share with others. At each stage of the research process, we have supported young people to engage in research not only as experts in their own experience, but also as investigators into their own research questions.

The literature indicates that participatory research may offer a variety of benefits for youth. Reviews of participatory research studies, for instance, have demonstrated that youth learned important leadership and research skills (e.g., survey design, data analysis), and demonstrated increased personal agency and sense of efficacy (Anyon et al., 2018; Powers & Tiffany, 2006). Participatory research also affords youth the opportunity to cultivate relationships with others of different ages and from diverse backgrounds (Powers & Tiffany, 2006). Additionally, the literature finds that participatory research may promote youth’s civic engagement (Powers & Tiffany, 2006). These findings echo our observations from working with youth throughout the research process. For example, we’ve seen the young people we work with, over time, take more ownership of their work and feel increasingly comfortable voicing their opinions and perspectives.

While we know that the process was a valuable experience for youth we work with, it was (and continues to be) even more valuable for us (adults on the team). By partnering with young people to identify thematic areas, research questions, data collection and data analysis methods, and appropriate content creation and dissemination efforts, we have been able to significantly increase the chances that our research findings will be more applicable to youth (Ito et al., 2020; Jacquez et al., 2013). We have also found that, by including youth throughout the research process, we have increased the reach of our work, as policy-makers, international organizations, educators, and other stakeholders are more likely to engage with research that has direct youth input (Powers & Tiffany, 2006). Additionally, we have found that we have shifted

the culture of our Center so that it even more strongly values the youth voice, which resonates with the literature around youth participatory research. Others, for instance, found that the research helped to challenge adult roles and perspectives, as well as institutional norms, cultures, and communities (Bertrand, 2019). From our own perspective, the participatory process has encouraged us to constantly explore our own blind spots and deficits and articulate them.

Consider the following examples from our research with youth:

- Conceptualization of research themes: Our paper “X,” for instance, highlights the role of memes as a form of civic engagement — a topic that was proposed by a 16-year-old we were working with at the time. Additionally, for our report “X,” we worked with youth summer interns in collaborative and engaging sessions to derive the areas of life that make up our concept “digital citizenship.” Working with young people to collectively identify areas of life helped us think about these areas from different perspectives. In framing “digital access,” for example, one youth intern suggested we approach the area at both an individual and collective level (e.g., mesh technologies).
- Selection of research methodologies: Our decision to audio- or video-record focus groups was based on the input from a young member of the team noting that she often can not distinguish her friends’ voices (she explained that adult voices are much easier to identify).
- Analysis of research data: Particularly in the context of privacy, having a youth sounding-board at our side, helping to make sense of the data, was extremely valuable. Even for us, it was challenging at times to consolidate and synthesize young people’s perspectives around extensive sharing of information online, with their deep care for their privacy and reputation.
- Sharing of our work: A number of papers we have co-published over the course of the years incorporate visuals illustrated by young people working with us. They felt that by adding such visuals to the research, a different audience would be able to engage with it.

Doing participatory research with youth can be challenging (Domecq et al., 2014; Van Staa et al., 2010). It can definitely feel disruptive (e.g., there were many days we wished the office would be more quiet, focused, or more efficient). It also requires a different skill set to do this exciting work — this may include new ways of thinking about young people, the research projects and products, and the research expertise each can contribute. For instance, one common struggle in youth-partnered research is to be able to change the typical power dynamics inherent in the adult/youth relationship. It is necessary to ask in which way the power structure allows, prevents, or suppresses the participation of young people in decisions and actions; which position the actors take in this power structure; and which power resources they have or which they lack. This becomes important for participatory research because power is often not directly visible. For our research, that meant, for instance, that we could not expect all youth to be able to come to the office (e.g., as youth advisors, researchers, summer interns). Instead, we may have had to meet them where they are (e.g., schools, libraries, community-based organizations). We had to demonstrate a certain openness and consideration for a young person's age and experience level. For instance, a 12-year-old may use academic vocabulary and discuss academic theory differently than a 16-year-old. It meant that, if possible, youth should be compensated for their work, that they have a say and are being heard, and their contributions (no matter how big or small) are acknowledged in private and (if they are comfortable with it) in public (e.g., by having youth as co-authors, co-presenters, co-teachers, etc.). Whenever possible, once the more formal research phase was over, we invested

resources in co-designing solutions (e.g., learning activities, educational resources, tools, self-care tool kits) with youth that help them navigate the opportunities and challenges the digital world may present. And it also meant — and still means — that we continue to invest countless hours in listening and mentorship.

Conclusions

Studying youth and young people’s lives across different disciplines is often seen as “seismographs of social and cultural changes, alerting us to new subjectivities and transformation” (Johansson & Herz, 2019, p. 2). In our research, we have been particularly interested in identifying, analyzing, and understanding such signals as possible indicators of seismic shifts with regard to youth’s interactions with digital technologies. The basic research question that has guided our work is focused on one particularly important tectonic feature, i.e., the extent to which youth’s use of digital technologies leads, or at least has the promise to lead, to a more participatory information environment. Our research suggests that in addition to enhanced youth engagement in shaping their lives in the digital environment, the inclusion of youth perspectives and practices can also contribute to an evolution of traditionally adult-normative understandings of concepts such as “privacy” or “news,” as we move from an analog to a digitally networked environment. In essence, this article suggests that in the area of youth and digital technologies, young people can only “serve” as seismographs if researchers develop and deploy a set of practices and infrastructures that are able to “listen” and “understand” youth signals — work that requires that youth themselves become partners in the research lifecycle. Such a functional argument for youth involvement in research is also supported by ethical arguments.

While we have developed and applied participatory research in the context of youth’s use of digital technologies, the approach might be of broader applicability when considering the state of play of youth studies more generally. Over the past several decades, youth studies have become a separate field of disciplinary and interdisciplinary research with dedicated textbooks (e.g., Furlong, 2013), book series (e.g., Springer’s “Young People and Learning Process in School and Everyday Life” Series), and journals (e.g., *Youth*, *Youth and Society*, and *Journal of Youth Studies*). Recent contributions have critically examined the youth-related theories that have emerged from this field of research and argued in favor of building bridges between different traditions within youth research, exploring ways in which youth studies can be moved in the direction of a sociocultural perspective (Johansson & Herz, 2019). While this work highlights the need and value of a more theoretically-oriented approach to youth studies, the questions of more inclusive research methods that support such an “updated” concept of youth studies remains unanswered. We envision that the participatory research approach with youth outlined in this article can contribute to bridging this methodological gap in youth studies beyond the application area of youth and digital technology.

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Children's Rights and Digital Technologies

Introduction to the Discourse and Some Meta-observations

Urs Gasser and Sandra Cortesi

Introduction

In many parts of the world, the emergence and spread of digital technologies, particularly the Internet, have led to an increasingly robust public debate about the opportunities and challenges associated with the use of digital technologies. From a legal and policy perspective, the debates cover a diverse set of issues, ranging from questions related to infrastructure and access, to issues such as intellectual property and quality of information, and take place in various forums at the national, regional, as well as global levels, and engage many different stakeholders. Across these debates, the impact of digital technology on *children*¹ has become a particular area of concern, given both children's widespread adoption of digital technologies² and their potential vulnerability in light of their state of development, among other factors (Livingstone, Carr, & Byrne, 2015a).

Initially, a strong emphasis of the public discussion about children and digital technology was on measuring and understanding tech-facilitated *risks* and potential harms related to child safety, online privacy, aggression, information overload, and addiction; this perspective was later supplemented by a discussion of the *opportunities* associated with children's use of digital technology (Palfrey & Gasser, 2008). More recently, the previously predominant risk-oriented and issues-driven policy conversation has turned into a more holistic debate about the challenges and opportunities of digital technologies for children and their interests.

It is in this context that the idea of children's *rights* for the digital age is examined.³ Despite important initial work (Livingstone & Bulger, 2013; Livingstone & Haddon, 2011; Livingstone & O'Neill, 2014; Livingstone et al., 2015a; Staksrud, 2013; Third, Bellerose, Dawkins, Keltie, & Pihl, 2014), this discourse is still in its infancy and currently dispersed across different forums and communities.

This chapter, written from a law and policy perspective as informed by interdisciplinary research, seeks to provide an introduction to the current debate about children's rights in the

digital age. It starts with a brief overview of children's engagement with digital technology, which is foundational for the understanding of what we might call the evolving *children's digital rights discourse*. The article then offers, in the spirit of a navigational aid, an overview of perspectives, issues, and key arenas, as well as actors, that constitute the children's digital rights discourse. Building upon selected examples that illustrate the thematic breadth of the debate, the chapter concludes with a series of cross-sectional meta-observations for further exploration and discussion.

Children's Engagement with Digital Technology

The discussion about children's rights in the digital age is motivated by the enhanced role that digital technologies play in children's *everyday lives*. While the availability of statistics on children's access and usage is limited, and data that is available is rarely truly representative of all children in a particular country or community, changes quickly, and is typically biased towards the Global North, the indicators in the textbox below might at least give an approximation of the role digital technology plays in children's lives.

- Many children in the Global North have access to the Internet. For example, 92 percent⁴ of children in the US go online daily and 99 percent⁵ of children in Canada are able to access the Internet outside of school. Also, 88 percent⁶ of children in the UK and 99 percent⁷ of children in Switzerland have Internet access at home. However in the Global South, many children remain less connected. For instance, 90 percent⁸ of children in Brazil access the Internet at least once or twice a week. Furthermore, only 77.8 percent⁹ of children in Colombia, 42.3 percent¹⁰ of children in El Salvador, 14.2 percent¹¹ of children in Malaysia, and 11.8 percent¹² of children in Bangladesh are connected to the Internet.
- More often now, children either own or have access to mobile phones and smartphones that they use to go online. For example, 98 percent¹³ of Swiss children, and 58 percent¹⁴ of boys and 60 percent¹⁵ of girls in Canada own a mobile phone. Seventy-three percent¹⁶ of all children in the US have access to a smartphone. Furthermore, 82 percent¹⁷ of children in Brazil use phones to access the Internet, and 56 percent¹⁸ of children in the UK use smartphones to go online daily.
- Social media platforms—particularly Facebook and YouTube—have become popular among children. Eighty-one percent¹⁹ of children in the US use some kind of social media. In Switzerland, 79 percent²⁰ of children use YouTube several times a week and 65 percent²¹ of children spend time on social networks several times a week. Also, 78 percent²² of children in Brazil, and 58 percent²³ of children in the UK report having profiles on at least one social networking site.
- The Internet has become the key medium for gathering information. Eighty-four percent²⁴ of children in the US, 78 percent²⁵ of children in Canada, and 17.1 percent²⁶ of children in Kenya use the Internet to search for information related to their health. Furthermore, 73 percent²⁷ of children in the US, 85 percent²⁸ of children in the EU, 68 percent²⁹ of children in Brazil, and 21.1 percent³⁰ of children in Kenya use computers and the Internet for schoolwork.
- Some children also use the Internet to play games. Fifty-six percent³¹ of US children, 80.1 percent³² of Malaysian children, and 63.8 percent³³ of Kenyan children spend time gaming. Additionally, 28 percent³⁴ of EU children and 45 percent³⁵ of Brazilian children played games with other people online.

- A smaller number of children utilize online platforms and/or digital means to become involved in political discourse. For instance, 41 percent³⁶ of US children engage online in acts of participatory politics. For 22.5 percent³⁷ of Malaysian children “politics” is one of the main motivations for using Facebook. In the UK, 12 percent³⁸ of children sometimes express their views online about political or social issues.
- Not all content children encounter online is good. Seventy-eight percent³⁹ of Canadian children report that they have come across racist or sexist content online. Moreover, in the UK, 20 percent⁴⁰ of children have been exposed to hate messages, 13 percent⁴¹ to pro-anorexia sites, and 11 percent⁴² to self-harm sites. Children in Brazil have reported very similar numbers.⁴³

Among the perhaps most impressive indicators that illustrate the role of digital technology in children's lives is the exponential increase in their access to and ownership of *digital devices* such as phones, laptops, and tablets, among others (Barbosa, 2014; Lenhart, Smith, Anderson, Duggan, & Perrin, 2015a; Porter et al., 2016)—propelled by the advent of the smartphone and the emergence of mobile apps (Lenhart et al., 2015a; Livingstone, Haddon, Görzig & Ólafsson, 2011; Madden, Lenhart, Cortesi, & Gasser, 2013; Mascheroni & Cuman, 2014). That said, it is important to acknowledge that a great disparity persists in children's access to digital technologies around the world and across demographics. Particularly children in the Global South as well as children in vulnerable and marginalized communities are often excluded from leveraging the benefits offered by the digital world (Cortesi & Gasser, 2015a; Kleine, Hollow, & Poveda, 2014).

The widespread adoption of digital devices that allow children to connect with the Internet, goes hand in hand with a growing number of social media and other *digital services* that have become available to children. Such applications include social media platforms (e.g., Facebook, Twitter, and Instagram); video-sharing sites (e.g., YouTube, Vine); messaging applications (e.g., Snapchat and WhatsApp); online blogs (e.g., Tumblr); music-sharing sites (e.g., Spotify and Pandora); and video games (e.g., Angry Birds, Halo). Despite the relative popularity of some platforms and services, recent data suggests that children simultaneously use similar platforms and applications for distinct purposes (Cortesi, 2013; Lenhart et al., 2015a; Madden et al., 2013), providing them with a wide-ranging variety of options to explore specific aspects of their creative expressions and share them with peers.

From a children's rights perspective, even more relevant than the number and diversity of digital devices, platforms, and services available to children are the *implications* of the use of these technologies. A growing body of evidence demonstrates how digital technologies are impacting (or at least have the potential to impact) children's lives around the world in both positive and negative ways. The following examples might be helpful to illustrate the relevance of digital technologies when it comes to children's rights and rights-related issues.

Positive Experiences

The Internet has become one of children's preferred sources of information. Through the Internet, children are able to access a variety of information, ranging from health topics and current events to college admissions literature and employment opportunities (Barbosa, 2014; Cortesi & Gasser, 2015b; Dobransky & Hargittai, 2012; Wartella, Rideout, Zupancic, Beaudoin-Ryan, & Lauricella, 2015). This information stems from a variety of online sources, including encyclopedias, social media, news outlets, MOOCs, videos, and podcasts among others (Purcell et al., 2012). Just as the type and location of the information sought by children vary,

so do the purposes. While some intentions can be more self-motivated, such as desires to confirm facts children encounter both online and offline, others might be more exogenously motivated, such as fact-finding in order to complete homework assignments (Barbosa, 2014; Rideout, 2015; Steeves, 2014; Third et al., 2014).

An important use of information children access online is in an *educational context*. Around the world, growing numbers of schools are utilizing digital media in learning and are employing connected learning methods (Buckingham, 2007; Ito et al., 2013; Ólafsson, Livingstone, & Haddon, 2014). Taking these new forms of learning into account, different stakeholders (e.g., governments, NGOs, foundations, and technology companies) are providing students and schools with tablets and computers and are improving the infrastructures of informal learning spaces, such as libraries and other community-based spaces. Such improved informal learning spaces may not only offer children better access to digital technologies and the Internet, but may also play a key role in helping children find supportive networks of peers and mentors, while also learning new digital skills (Cortesi & Gasser, 2015a; Ito et al., 2010; Jenkins, Ito, & boyd, 2015; Palfrey, 2015).

Digital technologies also play a central role in many children's lives when it comes to *recreation and leisure*. Online games, for instance, are particularly popular among children. A majority of children play games that include diverse genres, ranging from puzzles to first-person shooter games, and educational games (EU Kids Online, 2014; Lenhart et al., 2008; Rideout, 2015; UNICEF, 2013). Through playing games such as Minecraft and Scratch, children can acquire useful skills, including the ability to think creatively, and develop self-regulation, collaboration, and problem-solving skills (Junco, 2014; Roque, 2014; Roque, Rusk, & Blanton, 2013). As they spend more time gaming, children can also improve their digital skills, and gain more confidence in using the Internet, which in part allows them to climb the "ladder of opportunities" (O'Neill, Livingstone, & McLaughlin, 2011). These opportunities can extend to things such as innovation, entrepreneurship, civic engagement, and more.

While the Internet is useful for gaining new information and having fun, it has also become a vital means for children to connect and engage with other people. Social media platforms, video games, and mobile phones play a crucial role in how children *meet and interact with friends*. In many parts of the world, online platforms have become among the top places where children hang out with close friends. Social media environments in particular are environments where children's friendships are strengthened and challenged (Lenhart, Smith, Anderson, Duggan, & Perrin, 2015b; Popovac, 2012).

In addition, many children use digital technologies to create and share content online. Children, for instance, post pictures and videos and share status updates with their friends. A smaller subset writes longer entries, produces code, engages in film making, podcasting, or making types of creative multimedia content and digital art (Barbosa, 2014; Rideout, 2015; Rideout, Foehr, & Roberts, 2010). These various forms of *content creation* provide new opportunities for children to express themselves, make their voices heard, and to play a more active role in their communities (Cohen & Kahne, 2012; Shakuntala & Buckingham, 2013). These new types of enhanced participation may translate into civic engagement and various forms of political participation.

Negative Experiences

From the perspective of children's rights, the negative experiences associated with the use of digital technologies are as important as the positive forms of engagement described above. Some

of the well-researched risks that have a clear connection to children's (protection) rights are the receiving of inappropriate content, interactions between adults and children (e.g. harassment and grooming), and interactions initiated by children themselves (e.g., bullying and sexting) (Barbosa, 2014; Lenhart et al., 2011; Livingstone, Mascheroni, & Staksrud, 2015b).

Three types of risks that have children's rights implications can be distinguished in accordance with one particularly influential online risks classification scheme developed in the context of the EU Kids Online project: children's content, conduct, and contact risks (Livingstone et al., 2015b). Consider the following *examples*.

- *Content*: With the increased popularity of social media and video sharing platforms, children not only come across inspiring content, but may also be confronted with violent, sexually explicit, racist, or hateful content that they may find disturbing. Only a minority of children report having seen sexual content online, but those who have encountered such content find the experience upsetting to some degree (Livingstone, Kirwil, Ponte, & Staksrud, 2013; Tsaliki, Chronaki, & Ólafsson, 2014). Other types of online material that children may find upsetting include violent videos and games, rude and insensitive comments, and scary pop-up advertisements, all of which can reduce children's enjoyment of the online experience (Livingstone et al., 2013; UK Council for Child Internet Safety, 2013).
- *Contact*: Apart from the potential of children encountering unpleasant content online, there is also the risk of unwanted and unsolicited contact by adults. Older research suggests that few children report having experienced an online sexual solicitation (Ospina, Harstall, & Dennett, 2010; Whittle, Hamilton-Giachritsis, Beech, & Collings, 2013; Wolak, Mitchell, & Finkelhor, 2006) but those who were exposed to grooming⁴⁴ may experience severe negative consequences (European Union, 2013; Livingstone et al., 2013).
- *Conduct*: While a majority of social media-using children observe mostly kind behavior online (Lenhart et al., 2011), various studies have shown different prevalence rates of cyberbullying (Levy et al., 2012; Livingstone et al., 2011; Livingstone et al., 2013). Sexting is another well-researched conduct risk with rights implications (Livingstone et al., 2011; Mitchell, Finkelhor, Jones, & Wolak, 2012). Only a very small number of children report having sent or received sexts (Lenhart, 2009; Livingstone et al., 2011), but some children feel bothered or pressured by others who ask them to send sexts (Ringrose, Gill, Livingstone, & Harvey, 2012; Temple et al., 2012). Engaging in sexting can have severe negative consequences (boyd, 2011), including legal ramifications that children might not be aware of (Schrock & boyd, 2011; Strohmaier, Murphy, & DeMatteo, 2014).

The examples provided in the previous paragraphs demonstrate the increasingly important role that digital technologies play in the lives of many children. The section also indicates the various positive and negative experiences children might encounter in the digitally networked environment, with potential implications for children's rights, broadly conceived. Against this more factual background, the next section takes a closer look at the emerging discourse about children's rights in the digital age.

Mapping the Children's Digital Rights Discourse

The observations about children's access to and use of digital technologies in the previous section and the highlighted challenges and opportunities already indicate the *heterogeneity* of the

children's digital rights discourse from a phenomenological perspective. From an analytical perspective, a comprehensive mapping and evaluation of the implications of digital technologies vis-à-vis children's rights is further complicated by the fact that children's lives "are underpinned by an incoherent hotchpotch of legal principles and government policies" (Fortin, 2009, p. 3). Instead of aiming for a comprehensive map, it might be helpful to introduce three complementary *lenses* through which the children's digital rights discourse can be viewed and organized: Perspectives, issues, and arenas/actors.

Perspectives

Mirroring the children's rights discourse more generally, the debate about the specific implications of digital technologies for children's lives brings together a series of analytically distinct, albeit interrelated and sometimes overlapping perspectives. Borrowing from and expanding upon an earlier, pre-digital taxonomy (Franklin, 2002), the following perspectives might be highlighted:

From an *intellectual perspective*, a growing number of scholars from various fields study the interaction between digital technology and social conceptions of childhood, children, and society in order to understand how a rights-framework should be conceptualized (Davies, Bhullar, & Dowty, 2011; Livingstone et al., 2015a; Livingstone & O'Neill, 2014). Ethnographic studies, focus group research, and surveys are useful methodological approaches to gain a deeper understanding of the ways in which children interact with digital technology (boyd, 2014; Gray, 2009; James, 2014; Livingstone & Haddon, 2011; Madden et al., 2013; Third et al., 2014) informing both theoretical and advocacy work focused on children's rights.

From a *political perspective*, the impact of digital technologies on children has become the, often contested, subject of debates across party lines. Such debates often focus on risks associated with the use of the Internet, including violent information, child safety issues, and broader concerns about children's well-being (Staksrud, 2013; UNESCO, 2015). But also opportunities, particularly regarding twenty-first century skill-building and the potential of digital technologies for education, are debated in various political fora, including national parliaments (Western Sydney University, 2014).

Mirroring the political debate, from a *legal perspective*, law- and policymakers at the national and regional level have entered debates about the ways in which children must be protected (Bartholet, 2011) in light of the risks resulting from digital technologies (Palfrey, boyd, & Sacco, 2010). In addition to such paternalistic approaches, the question of the need for "updated" rights of children—including participation rights—given the changing digital world in which they live has been debated in policy circles. Occasionally, even new rights have been proposed.

Within the evolving legal framework, a broad range of existing institutions (*institutional perspective*) committed to children's rights (e.g., www.derechosdigitales.org; Global Kids Online; www.voicesofyouth.org) have added a digital agenda to their mission and work, indicating an increased awareness of digital technology in children's lives (Pawelczyk & Singh, 2014). In addition, new organizations have been created—including, for instance, helplines (e.g., www.icanhelpline.org; www.saferinternet.org.uk)—to address some of the digital challenges faced by young people. A number of institutions and initiatives have also emerged to support children's rights to participate, particularly as users of local government services such as

scholars, libraries, educational institutions, etc. that increasingly embrace the potential digital technology offers.

Conversations about the implications of digital technology also take place at the international level (*international perspective*). For example, the Committee on the Rights of the Child devoted the Day of General Discussion—as part of the Committee's 67th Session in September 2014—to digital media and children's rights in order to gain a deeper understanding of the effects of children's engagement with digital technology and develop rights-based response strategies to maximize opportunities while minimizing risks.

Additionally, scholars and practitioners (Gasser, 2014a; Kleine, 2016; Third et al., 2014), as well as NGOs (e.g., www.voicesofyouth.org) have advocated for an enhanced engagement of children in the discourse on digital rights and pointed out the need to include a *children's perspective*. RErights.org—an initiative by the Young and Well Cooperative Research Center and Western Sydney University in partnership with Digitally Connected and UNICEF's Voices of Youth—is a very recent example of how different stakeholders come together and invite children globally to explore and define their rights in a digital age, and then translate children's views for decision makers.

When asked about their rights in the digital world, children highlight the right to access as a precondition to exercise many of their rights, according to a recent consultation among children from 16 countries (Third et al., 2014). The importance of access to digital technology is amplified by children's view of digital media as a crucial means to exercise their rights to information, education, and participation. At the same time, children express concerns about the ways in which participation in the digital environment might compromise their protection rights (Third et al., 2014).

Issues

The variety of perspectives on children's interaction with digital technologies indicates the *diversity* of issues up for discussion when considering the ramifications for children's rights in the digital age. As noted previously, children's rights are a relatively unstructured amalgam of diverse norms, policies, and principles at the national, regional, and global level, which makes it virtually impossible to identify and comprehensively systematize the relevant issues that emerge as more and more children transition from an analog to a digitally connected environment. That being said, tentative *issue clusters* can be formed, broadly speaking, based on either a phenomenological or normative approach.

A *phenomenological approach* takes as a starting point the growing (but heavily biased towards the Global North, see Livingstone & Bulger, 2014) body of knowledge about children's access to and use of digital technologies, and arrives at children's rights and rights-related issues from the bottom up. One example where legal and policy aspects are examined in a larger societal and developmental context is the research conducted by the Youth and Media team at the Berkman Klein Center for Internet & Society at Harvard University. Building upon the earlier work by John Palfrey and Urs Gasser, thematic areas include the role of digital technology in children's identity formation and possible legal ramifications, issues related to safety and information privacy, creative practices and freedom of expression, problems related to information quality and overload, and opportunities in the field of innovation, learning, and activism, to mention a few of the key areas.

For each of these clusters, the best available data is analyzed in order to identify challenges as well as opportunities, and to examine, from an ecosystem perspective, which type of (parental,

educational, social, legal, etc.) intervention is best suited to empower children where possible and protect them as necessary. In this mode of exploration, legal and policy issues—including, but not limited to, children’s rights issues—emerge from the bottom-up and may reveal problem zones or opportunities that have yet to be addressed by law- and policymakers.

A *normative approach* uses a conceptually different, but complementary starting point by looking at existing frameworks and contrasting them with children’s access and usage practices related to digital technologies. Given the importance of the UN Convention on the Rights of the Child (CRC, United Nations General Assembly, 1989; Fortin, 2009), the CRC is often used as a normative frame to identify the implications of digital technology for children’s rights. Sonia Livingstone and Brian O’Neill (2014), for example, developed a helpful framework based on the provision, protection, and participation rights set forth in the CRC to map issues related to children’s use of digital technology, and to formulate Internet governance policies in the interest of children. According to their analysis, the following issues are particularly salient:

- *Protection rights:* Illegal content and activity on the Internet involving the sexual abuse of children (Art. 10 and Art. 34); trafficking and other forms of exploitations that are mediated and even exacerbated by the mass use of the Internet (Art. 35 and Art. 36); initiatives aimed at protecting children from material injuries to child’s well-being (Art. 17e and Art. 18); right to be protected from arbitrary or unlawful interference with privacy or unlawful attacks on honor and reputation (Art. 16 and Art. 8).
- *Provision rights:* Appropriate online content for children from diverse sources to promote social and moral well-being (Art. 17); implications of children seeking recreation and leisure online (Art. 31); right to education in relation to the Internet (Art. 28); acquisition of digital skills that enable responsible life in a free society (Art. 29).
- *Participation rights:* Right to be consulted in all matters affecting them in accordance with the age and maturity of the child (Article 12); right to freedom of expression (Art. 13); right to freedom of thought, conscience, and religion (Art. 14); rights to freedom of association and to freedom of peaceful assembly (Art. 15).

While not all-encompassing, the CRC provides a useful structure to map a diverse set of issues emerging from children’s interaction with digital technologies onto core clusters and link them back to the more conventional children’s rights discourse. Both phenomenological and normative approaches to issue mapping can be supplemented by key areas and actors involved in the children’s digital rights discourse.

Arenas and Actors

In addition to differentiating among perspectives, approaches, and issues involved, it might be helpful to distill a number of key arenas that are particularly relevant to the children’s digital rights discourse. We propose *four* such arenas: The general debate about Internet governance and digital rights; specific child-focused efforts aimed at translating children’s rights into the digital age; the ramifications of digital technologies in the context of the implementation of children’s rights, and research on children’s digital rights. The following paragraphs briefly describe each arena and highlight some examples.

Internet Governance and Digital Rights

As already mentioned, the debate about children's rights in the digital age does not take place in a vacuum. At the most basic level, it can be seen as part of a larger debate about the governance of the Internet (Livingstone et al., 2015a), here understood as "the development and application by governments, the private sector and civil society, in their respective roles, of shared principles, norms, rules, decision-making procedures, and programs that shape the evolution and use of the Internet" (Report of the WGIG, 2005).

Historically, provisions aimed at protecting children on the Internet from exposure to inappropriate content were among the first Internet-specific laws introduced at the *national* level. In the United States, for instance, the Communications Decency Act of 1996 attempted to regulate children's exposure to Internet indecency (and obscenity), but was later overturned by the Supreme Court as unconstitutional in light of First Amendment free speech rights. Over time, the emphasis shifted from content risks to certain types of contact risks, as a wave of anti-cyberbullying legislation illustrates (Hinduja & Patchin, 2015). In parallel, the protection of children's privacy in digital environments has gained broad attention by national law- and policymakers (Gasser, 2015).

The implications of digital technologies for children's rights did not only come up at the national, but also at the *global* level, and thematically expanded from questions related to risks and protection to opportunities and associated enabling and supporting rights (Livingstone et al., 2015a). An early case in point is the Tunis Commitment of November 2005 as part of the World Summit on the Information Society, which recognized the role of digital technologies "in the protection of children and in enhancing the development of children" and promised to "strengthen action to protect children from abuse and defend their rights in the context of ICTs," emphasizing the best interest of the child as a primary consideration (ITU, 2005).

More generally, children's digital rights are also recognized in the context of a growing number of *Internet Bills of Rights* aimed at articulating a set of political rights, governance norms, and limitations on the exercise of power in the digitally networked world (Gill, Redeker, & Gasser, 2015). Several of these bills include children by using broad terms such as "a person" or "all people" or "every human," etc., while others explicitly address children. The iRights Coalition document, for instance, is very explicitly directed toward children (http://irights.uk/the_irights/). In addition to protective rights, many of these bills also enlist participation rights and provision rights (Gill et al., 2015).

As the definition mentioned above indicates, traditional legal instruments are only one tool in the Internet governance kit. Following a more general trend of problem solving in cyberspace (Weber, 2014), *self-regulation* in its different manifestations has played a prominent role when addressing children's risks online, often based on the argument that this mode of regulation can better keep pace with rapid technological and behavioral change (Livingstone et al., 2011). An example in this category is INHOPE, a multi-stakeholder network of 51 hotlines in 45 countries worldwide that was launched under the EU Safer Internet Programme and deals with illegal content online, committed to eliminating child sexual abuse from the Internet (Tropina & Callanan, 2015).

In parallel, the venues for different kinds of *multi-stakeholder approaches* to the children's digital rights, broadly understood, have multiplied over the years. The Internet Governance Forum (IGF), for instance, has become an increasingly important platform in which to discuss and develop best practices relevant to children's access to and use of digital technologies. At the IGF 2015, for instance, sessions were dedicated to child online protection through multi-

stakeholder engagement, multi-stakeholder solutions for youth-produced sexual content, and mitigation of online hate speech and youth radicalization, to name just a few—in addition to discussions as to what extent young people themselves should be part of Internet governance (<http://igf2015.intgovforum.org/>).

Child-Focused Frameworks and Strategies

As the previous paragraphs demonstrate, the list of issues emerging from digital technologies that are relevant from a children's right perspective is long and diverse and includes both risks and opportunities. In addition to the patchwork of laws, policies, and practices that have emerged over the past two decades, more *comprehensive frameworks and strategies* aimed at dealing with the digital implications for children's rights have been proposed, examined and, in some instances, established.

At the *global* level, it is particularly noteworthy that the Committee on the Rights of the Child devoted the Day of General Discussion as part of the Committee's 67th Session in September 2014 to "Digital media and children's rights." The goal of the discussion was:

[T]o better understand the effects of children's engagement with social media as well as information and communication technologies (ICT), in order to understand the impact on and role of children's rights in this area, and develop rights-based strategies to maximize the online opportunities for children while protecting them from risks and possible harm.

(Office of the United Nations High Commissioner
for Human Rights, 2014)

Efforts to promote greater opportunities for young people online by stemming potential risks also take place at the *regional* level. The European Union, for instance, promulgated the "European Strategy for a Better Internet for Children" in 2008. This program, which is built upon the Safer Internet Program and administered through the EU's "Connecting Europe" initiative, seeks to balance the opportunities and risks of the Internet for youth through a combination of implementing government oversight, improving digital and technological literacies, and encouraging youth and parents to work together for self-regulation. While the initial model focused more narrowly on specific risks, recent revisions are broader in scope in order to understand the impact of this multi-stakeholder European effort on child rights (Livingstone et al., 2015b).

The OECD, to take another example of a strategic approach, proposed its own framework for mitigating online risk and empowering young people based upon the lessons of the EU's approach and other efforts. While the OECD expressed concern over what it saw as the risks of youth Internet usage, the organization noted that any means of promoting greater safety online must also, "respect the rights of children and the freedom of Internet users" (OECD, 2012, p. 9).

Implementation of Strategies and Frameworks

In addition to the debates about children's digital rights at the level of abstract norms and frameworks, it is important to consider the implementation of strategies and frameworks aimed at securing and promoting children's rights in the digitally networked world.

There have been many efforts by various stakeholders to promote and enforce the principles laid out by the CRC (Thomas, 2011). Independent human rights institutions known as

Children's Commissioners or Ombudsmen, for instance, are regional and national offices that advocate for and protect the rights of children by ensuring that adequate policies and services for children are in place. Non-governmental organizations and other special-interest groups can also work with children, guardians, organizations, and the government to raise awareness and instigate change. Across these implementation efforts, the implications of digital technology for children's rights have become a topic of interest. But digital technology also plays an important role as a *communication tool* when raising awareness about children's rights by disseminating knowledge and encouraging children to exercise their rights online.

Organizations that promote digital literacy and digital citizenship are other interesting implementers. Several of them have developed curricula that empower youth to better navigate the Internet. For instance, the Good Play team based at the Harvard Graduate School of Education, in collaboration with Henry Jenkins and his Project New Media Literacies group, developed *Our Space*, a casebook of classroom activities related to digital ethics. MediaSmarts, a Canadian not-for-profit charitable organization for digital and media literacy created a curriculum to empower children and youth with the critical thinking skills to engage with media as active and informed digital citizens. *Con Vos en la Web* developed a helpful set of guides and curricula in Spanish on topics such as the importance of protecting personal data, privacy, Internet safety, social media, and online games. Other organizations encourage children to put these ideas into practice, such as RErights, an online platform that engages children in a series of activities that ask them to use various digital tools and resources to express themselves and explore their rights in the digital age.

Research Areas

The digital child rights discourse is also shaped by various research efforts that occur at national, regional, and global levels as well as in translational contexts. These inquiries into how children interact with digital technologies provide a better understanding of how to conceptualize children's rights and can, ultimately, translate into policy solutions that uphold these rights in digital contexts.

Studies on child Internet and digital technology usage have been conducted in *individual countries* around the world, including the United States. Within US research, studies often include a mix between quantitative and qualitative research methods. While quantitative methodologies are employed in reports such as various Pew Internet & American Life publications (Lenhart et al., 2015a) and Generation M2 (Rideout, Foehr, & Roberts, 2010) to generate descriptive statistics, other research efforts utilize a mix of quantitative and qualitative methodologies to delve further into the rationales behind children's digital technology usage (Rideout, 2015; Madden et al., 2013). Through the combination of these two approaches, there is an increasingly complete body of knowledge for understanding children's rights in a digital context within the countries in which these national studies occur.

In addition to national level inquiries, the last decade has been marked by the rise of studies examining child Internet and digital technology usage within *regions*. These studies, most prominently the EU Kids Online project (Livingstone & Haddon, 2011), allow for an understanding of the similarities and differences among children in different national contexts but within the same area of the world. Through regional research efforts, investigators are able to provide data to a wide array of policymakers in countries across the region. These regional level projects can provide important comparisons between regions to understand wider-reaching usage trends.

In an effort to aggregate and analyze trends globally, some organizations have undertaken *international level inquiries* into how children use technology. While these organizations share the goal of identifying international trends that span regional boundaries, their approaches differ. Due to disparities in global data availability, some studies, such as UNICEF Voices of Youth's exploratory studies in the Ukraine (Beger, Hoveyda, & Sinha, 2011), Kenya (UNICEF, 2013), and Malaysia (UNICEF, 2014), seek to provide descriptive national data placed in an international context. Conversely, other studies attempt to move beyond description to synthesize data from around the world to analyze international trends (Livingstone & Bulger 2013; Third et al., 2014). Despite utilizing differing approaches, the research is unique in that it provides information on the state of children's interaction with digital technology across the globe, including the Global South.

Utilizing the findings of the three preceding research areas, some scholars have attempted to directly inform policymaking related to children's rights in the digital age. Instead of conducting original research or describing and analyzing datasets alone, these translational research efforts, such as Dr. Tanya Byron's report to the UK Department of Children, Schools, and Families (2008) and the Internet Safety Technical Task Force's Multi-State Working Group report in the US (Palfrey, boyd, & Sacco, 2010), propose specific policies based upon research findings. Through these translational reports, researchers are able to build upon academic findings to inform and shape the children's digital rights discourse, both at the national and international level.

Meta-Observations

The high-level overview of the children's digital rights discourse at the intersection of children's lives, digital technology, and the law—offered from a largely descriptive perspective—leads to a number of normative observations that can be organized into general reflections on the discussion and more specific observations about the role of law as it interacts with the lives of children that are increasingly shaped by digital technologies.

General Observations

In terms of cross-sectional general observations, the children's digital rights discourse is characterized by a high degree of *heterogeneity*. The previous sections have highlighted the diverse set of perspectives, issues, arenas, and actors associated with the topic. This heterogeneity is characteristic of contemporary debates about the impact of digital technologies on society more broadly and has several sources. As noted earlier, the notion of children's rights as such lacks a precise definition and invites a plurality of perspectives. The thematic breath is also indicative of the manifold ways in which children's lives and the law interact with each other. This complexity is amplified by the widespread adoption of digital technologies, which in turn shapes the lives of children in various ways, as the earlier section suggested, and also challenges existing legal norms in many respects (Palfrey & Gasser, 2008).

This leads to a second general observation: The highly *dynamic nature* of the conversation about children's digital rights. Located at the intersection of children's lives, digital technologies, and law, the discourse mirrors the rapidly changing landscape of digital technology as well as adaptive user behavior, which we can observe particularly among children (Cortesi, 2013). Simultaneously, the debate is exactly concerned with the question of if and to what extent the legal system in general and children's rights in particular need to be adjusted in light

of the challenges and opportunities mentioned before. Putting the three elements together, the children's digital rights discourse is necessarily a moving target until the overall entropy decreases and the system reaches a new, semi-stable equilibrium.

The heterogeneity and inherent dynamism of the children's digital rights discourse points towards a third observation, which might be labeled as the *methodological challenge*. To understand children's access and use of quickly evolving digital technologies and consider the implications for children's rights and children's rights law requires a combination of disciplinary perspectives and associated methods, ranging from ethnographic know-how to legal expertise, to mention just two salient examples. This working together among disciplines and the pooling of knowledge is a necessity when considering law-based interventions to protect and empower children in an age of evidence-based law- and policymaking. But this interdisciplinarity also creates significant challenges. Participants in the children's digital rights discourse who have a social science background, for instance, often use a different vocabulary than contributors with a legal background, and vice versa. Given the relatively nascent status of the debate about children's rights in the digital age, interfaces that can "translate" among the disciplinary language on the one hand, and research and law-making on the other hand, have not fully developed yet (Gasser, 2014b).

Specific Observations

Focusing on the legal system as the third component in the triangle of children's lives, digital technologies, and the law, the following three specific observations deserve to be highlighted based on the broader overview of the children's digital rights discourse in the previous section.

First, it might be helpful to look at the conversation about children's rights in the digital age through the more general lens of information law to better understand how digital technology and its ramifications interact with the law. From such a perspective, certain *response patterns* can be observed when it comes to the evolution of legal norms vis-à-vis technological change (Gasser & Burkert, 2007)—patterns that also might be helpful when anticipating or analyzing possible responses of legal norms encapsulating children's rights. One such pattern suggests that the law's default response mode when confronted with an arguably new (technological or behavioral) phenomenon is *subsumption*, i.e., the application of the existing rule (for instance a right under the CRC) to the new phenomenon (e.g., children's expression online). Legal norms that are considered to have a fundamental character—such as fundamental rights—are more abstract and can absorb new phenomena more easily.

In contrast, it typically requires a particular set of qualified circumstances for the legal system to innovate itself at the level of norms that are highest in its own hierarchy. Such insights from pattern analysis might be helpful, for instance, when considering—from an advocacy perspective—where the best opportunities are to strengthen children's rights in the digital age. It might indicate, to stipulate a hypothesis, that norms at lower levels in the norm hierarchy may be more permeable for children's digital rights issues than foundational frameworks.

The second, cautionary observation specific to the interplay between law and children's digitally connected lives links back to the general reflection about the dynamic ecosystem in which the children's digital rights discourse is situated: the *justification* of legal (including rights-based) interventions. As in all other areas of law, interventions aimed at governing children's lives in the digitally connected environment need to be politically justified.

This process is complicated by a number of factors. The fluidity of children's online behavior in interaction with rapidly evolving technology, for instance, makes it often difficult to justify

specific interventions over time. Further, despite a wealth of anecdotal evidence and great progress made over the past decade, not all issues can be analyzed based on solid empirical data that might help to justify legal and regulatory interventions. Finally, even if enough evidence has accumulated to propose change, it is typically challenging (and requires time) to find normative consensus in heterogeneous environments given the widespread trade-offs and role conflicts. These observations help to explain, for instance, some of the heated debates about the need for and scope of legal interventions aimed at protecting children online.

An information law perspective reveals not only response patterns and points to typical challenges that occur when law interacts with digital technology. It also indicates a series of significant *implementation challenges* in cases where law, as a result of a complex set of interactions, intervenes to regulate a digital phenomenon. The list of such implementation challenges is long and includes definitional challenges, the question of the best timing of intervention, and other issues (Gasser, 2014a).

In the context of this chapter, given the strong emphasis on rights-based interventions, it seems worth emphasizing that the legal toolkit provides a *broad range of modes* (direct intervention, co- or self-regulation) *and strategies* (command-and-control, incentive based, rights and liabilities, etc.) that can be applied—and where necessary mixed in the sense of blended governance—to pursue certain policy objectives such as, for instance, the safety and privacy of children in the digitally connected world. Evidence from information law demonstrates the benefit of considering all available instruments in the toolbox when addressing a specific issue (Gasser, 2015). With respect to children’s rights in the digital age, such a perspective suggests a broad understanding of the term “rights”—consistent with the framing of this chapter.

Consistent with the notion of a blended governance approach is the related (and final) observation that the *realization* of children’s rights in the digital world is a *shared responsibility* among many actors (“stakeholders”)—including children themselves, parents and other caregivers, educators, technology companies, governments and international organizations (Palfrey & Gasser, 2008). Recent experiences with legal interventions in quicksilver technology environments—and law’s own limitations—demonstrate the promise of children’s empowerment through educational strategies (Thierer, 2013). At the same time, however, it is the lack of access to parental and other educational resources that, in many of the less-privileged parts of the world, calls for a more *holistic approach* and the working together of all actors through multi-stakeholder processes (Livingstone et al., 2015a).

Notes

- 1 In accordance with the UN Convention on the Rights of the Child, we use the term children to refer to all *legal minors*—generally, that is human beings below the age of eighteen years.
- 2 According to Livingstone, Carr, and Byrne (2015a), “an estimated one in three of all Internet users in the world today is below the age of 18” (p. 1).
- 3 While the contours of what constitutes children’s rights have become clearer over the past decades (Franklin, 2002, p. 19), there is no single accepted definition or theory of the rights held by children available (Mangold, 2002, p. 75). These conceptual and definitional problems carry over when examining the interplay between digital technologies and children’s rights. For the purpose of this chapter, we propose a frame that takes into account different schools of thought and perspectives, and embraces a diverse set of activities and arguments related to children’s rights in the digital age. We introduce the term *children’s digital rights discourse* as a shortcut for such a frame, which includes a diverse set of issues at the intersection of children’s lives, digital technology, and the law.
- 4 Lenhart et al., 2015a; children ages 13–17.
- 5 Steeves, 2014; children grades 4–11.

- 6 Ofcom, 2014; children ages 5–15.
- 7 Willemse et al., 2014; children ages 12–19.
- 8 Barbosa, 2014; children ages 9–17.
- 9 ITU, 2015; children and young people ages 15–24.
- 10 ITU, 2015; children and young people ages 15–24.
- 11 MCM, 2013; children ages 15–19.
- 12 ITU, 2015; children and young people ages 15–24.
- 13 Willemse et al., 2014; children ages 12–19.
- 14 Steeves, 2014; children grades 4–11.
- 15 Steeves, 2014; children grades 4–11.
- 16 Lenhart et al., 2015a; children ages 13–17.
- 17 Barbosa, 2014; children ages 9–17.
- 18 Mascheroni & Ólafsson, 2014; children ages 9–16.
- 19 Madden et al., 2013; children ages 12–17.
- 20 Willemse et al., 2014; children ages 12–19.
- 21 Willemse et al., 2014; children ages 12–19.
- 22 Sozio et al., 2015; children ages 9–16.
- 23 Sozio et al., 2015; children ages 9–16.
- 24 Wartella et al., 2015; children ages 13–8.
- 25 Steeves, 2014; children grades 4–11; including “news”.
- 26 UNICEF, 2013; children ages 12–17.
- 27 Rideout, 2015; children age 13–18.
- 28 Ólafsson, Livingstone, & Haddon, 2014; children age 9–16.
- 29 Barbosa, 2014; children ages 9–17.
- 30 UNICEF, 2013; children ages 12–17.
- 31 Rideout, 2015; children ages 13–18.
- 32 Balraj, Pandian, Nordin, Nagalingam, & Ismail, 2013; children ages 14 and 16.
- 33 UNICEF, 2013; children ages 12–17.
- 34 EU Kids Online, 2014; children ages 11–16.
- 35 Barbosa, 2014; children ages 11–17.
- 36 Cohen & Kahne, 2012; young people ages 15–25.
- 37 MCM, 2013; young people ages 13–24.
- 38 Ofcom, 2014; children ages 12–15.
- 39 Steeves, 2014; children grades 7–11.
- 40 EU Kids Online, 2014; children ages 11–16.
- 41 EU Kids Online, 2014; children ages 11–16.
- 42 EU Kids Online, 2014; children ages 11–16.
- 43 Barbosa, 2014; children ages 11–17.
- 44 The US Department of Justice, NSOPW, defines grooming as “a method of building trust with a child and adults around the child in an effort to gain access to and time alone with her/him.” The Council of Europe defines grooming as “solicitation of children for sexual purposes.” For more information see also Ospina, Harstall, & Dennet, 2010.

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Student Privacy and the Law in the Internet Age

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Abstract and Keywords

New types of digital technologies and new ways of using them are heavily impacting young people’s learning environments and creating intense pressure points on the “pre-digital” framework of student privacy. This chapter offers a high-level mapping of the federal legal landscape in the United States created by the “big three” federal privacy statutes—the Family Educational Rights and Privacy Act (FERPA), the Children’s Online Privacy Protection Act (COPPA), and the Protection of Pupil Rights Amendment (PPRA)—in the context of student privacy and the ongoing digital transformation of formal learning environments (“schools”). Fissures are emerging around key student privacy issues such as: what are the key data privacy risk factors as digital technologies are adopted in learning environments; which decision makers are best positioned to determine whether, when, why, and with whom students’ data should be shared outside the school environment; what types of data may be unregulated by privacy law and what additional safeguards might be required; and what role privacy law and ethics serve as we seek to bolster related values, such as equity, agency, and autonomy, to support youth and their pathways. These and similar intersections at which the current federal legal framework is ambiguous or inadequate pose challenges for key stakeholders. This chapter proposes that a “blended” governance approach, which draws from technology-based, market-based, and human-centered privacy protection and empowerment mechanisms and seeks to bolster legal safeguards that need to be strengthened in parallel, offers an essential toolkit to find creative, nimble, and effective multistakeholder solutions.

Keywords: Student privacy, Student data, Data privacy, FERPA, COPPA, PPRA, Ed tech, Blended governance

Introduction

Digital technologies are transforming youth¹ learning experiences in a number of ways and affect not only what they learn but also where learning happens and who gets involved in these processes.² Online learning platforms, for instance, are blurring the boundaries between formal and informal spaces of learning, challenging seemingly

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straightforward and legally relevant categorizations, such as when a youth is in school and where that school is located. Today, youth may sit in a brick-and-mortar school in the rural United States and watch a live-streamed course taught by someone in China, for example. Digital ed technologies³ are entering not just traditional learning environments but also opening up new spaces of teaching and learning, such as Scratch, an online creative community hosted by the Lifelong Kindergarten Group at MIT Media Lab, which is designed for youth but available for anyone to “program [their] own interactive stories, games, and animations.”⁴

In addition to shifting and melding the contexts in which learning is happening, new technologies have also expanded the circle of actors involved in educational efforts. In particular, changes to what learning and education mean in the digital age have been accompanied by an increasingly important role that commercial and other third-party providers (outside of K-12 public schools) play in education. Both of these shifts—the blurring lines of where learning happens and the new actors that enter the arena—have deep privacy implications, as this chapter demonstrates. Taken together, it has become more challenging to establish a zone of privacy in which young people can safely and meaningfully engage in a broad range of learning experiences necessary for them to thrive in environments that offer agency, autonomy, and equity.

Before examining these shifts in greater detail, it might be helpful to clarify what privacy means and why we think it matters. Privacy is a complex empirical phenomenon and multifaceted normative concept that does not lend itself to a universal or even a consistent definition with a given environment, such as a learning ecosystem.⁵ This chapter proposes a broad functional understanding of privacy in the sense that it “is about establishing a locus which we can call our own without undue intervention or interruption—a place where we can vest our identities.”⁶ The interlinkage between privacy and identity is particularly salient—and complex, given the prevalence of digital technologies⁷—in the youth context, as the process of growing up is intrinsically connected with exploring one’s identity. From such a developmental perspective, ensuring adequate levels of privacy and spaces for identity formation is particularly crucial for youth populations (within formal learning environments and beyond) so that they feel comfortable tackling new challenges, taking risks, and making mistakes. In order to work toward this goal, it’s crucial to empower youth with agency and autonomy, as well as treat them with equity. Absent these values existing alongside the protection of (data) privacy, youth will be constrained in their ability to engage in the range of behaviors necessary to meaningfully develop their own identities.

While there appears to be a general consensus that youth are entitled to heightened privacy protections—regardless of exactly how privacy is defined—due to youth’s increased vulnerability and developmental status,⁸ lawmakers, regulators, administrators, and other adult decision makers are struggling to take a student privacy law regime that was largely designed for the brick-and-mortar schools, technologies, and practices of the twentieth century and adapt it to the digitally connected world of the twenty-first. In this chapter, we aim to help bridge this divide, first by offering an overview of some the major shifts

underlying the current and emerging ed tech landscape, including a “ground-level” description of the key challenges and opportunities for student privacy that characterize it. Then, we briefly describe the current federal legal framework for youth privacy in primary and secondary public education in the United States established by the federal statutory and accompanying regulatory schema mentioned earlier. We also analyze the most pressing gaps in this framework, including their sources and their relative strength. Finally, we outline the toolkit that is being used or could be used to address these challenges, including new state legislation, school district policies, and technological safeguards.

The chapter draws upon our insights gained through our multidisciplinary and multi-stakeholder collaboration in the Student Privacy Initiative at the Berkman Klein Center for Internet & Society at Harvard University, which examined how the adoption of new technologies in educational settings intersects with policy regimes and with emerging developments in educational theory and institutional practices, each of which is associated with privacy-relevant challenges and opportunities.⁹

Digital Ed Tech Revolution: Overview of Tectonic Shifts in Today’s Student Data Privacy Landscape

Learning knows no boundaries. Every teacher who has inspired a student understands the infinite horizons of education. In public primary and secondary schools in the United States today, this expansiveness has taken on a whole new dimension as the frontier of cyberspace and the digital technologies it connects expand into brick-and-mortar schools. While the scope, pace, and terms of digital ed tech adoption varies across school systems, there is a nationwide trend toward more inclusion of digital technologies.¹⁰

Through this development, more is changing for students than whether they learn math from an app instead of an abacus. Today’s students are participating in a seismic transformation of brick-and-mortar schools into digitally connected learning environments—a shift that learners, their parents, teachers, administrators, and other adult stakeholders may not fully realize as the transformation is often the result of several shifts at the nexus of law, technology, society, behavior, and aligned spheres that are reshaping education in ways that are sometimes very visible and, other times, much less so. The student privacy-relevant shifts include: (1) the rise of connected institutions; (2) an increase in interconnectedness among the participants through these institutions; (3) an increased role for data analytics that educators can use in a variety of ways; and (4) a lack of clarity around decision-making.¹¹ Each shift will be addressed in the following, with a focus on the opportunities for and challenges to student privacy that shape this terrain in the formal educational setting of public primary and secondary schools in the United States.¹²

Connected Institutions

In many parts of the United States, the evolution of digital ed tech and its broad impact on school systems is moving fast to create “connected” educational institutions that increasingly transcend the traditional boundaries and inner workings of brick-and-mortar schools.¹³ New and emerging digital technologies—cloud computing, internet of things (IoT), sensors, robotics, Artificial Intelligence (AI), and beyond¹⁴—are now also embraced by schools, leading to highly interconnected environments that blend “online” and “of-line” spheres of learning in such ways that it is becoming less meaningful to speak of these as different spaces.¹⁵

These services and devices may be created specifically for educational settings or imported from other contexts into education. They may be used with “top-down” permission from administrators, or they may come in through the “side door” of individual teachers’ choices. Covering a broad range of functionalities and coming in many different shapes, digital ed tech affordances typically share one feature in common: They enable the collection and use of a large amount of data about students at an unprecedented granularity when compared to previous analog information systems. While digital technology facilitates pedagogical innovation and comes with tremendous promise for better learning, there is an urgent need to re-establish secure zones that protect student privacy.¹⁶

Information about individual students generated and collected within the context of brick-and-mortar schools goes beyond the schoolhouse doors. Where does it go? This question isn’t entirely new, but answering it was far simpler in the pre-digital age. Under pre-digital conditions, information would leave when it was sent home to parents in the form of report cards (permissible). Information would leave when it was shared with a third-party vendor who supplied cafeteria food (permissible, with the right contractual framework). These and other information flows tended to be straightforward and highly regulable.

Compare and contrast these examples with current practices in the world of digital ed tech, in which third-party vendors supply an ever-expanding roster of digital devices, products, and services used at the school, district, and state level, that opens the floodgates for constant data collection, aggregation, analysis, and exchange. Consider, for instance, a situation in which a teacher is using a popular social networking platform for a shared student project, or where the school administration stores student records in the cloud (online) of a commercial provider of such a service, or where the student email accounts are operated by a commercial vendor.¹⁷ Consider also how students’ digital data might be used by other governmental sectors; for example, a school that uses digital ed tech to track or respond to disciplinary incidents might share that information with law enforcement or the juvenile justice system. It also might find itself making more referrals to those systems based on the data it collects, thus feeding the school-to-prison pipeline, which has a disproportionate impact on students of color and other underrepresented and often underserved student groups as research suggests.¹⁸

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In all these and related scenarios, the flow of data that is collected, aggregated, analyzed, and shared is much harder to track as many more actors—ranging from school personnel to tech vendors to government agencies—are involved in this digitally interconnected ecosystem. Similarly, it is much harder to determine who can access the data, at whose discretion, and who might use it toward what purposes and in what contexts. The full extent of these and related data uses may be difficult—if not impossible—for students, teachers, parents, and others to appreciate, in part because the privacy policies, terms of use, and related policies and practices by digital ed tech vendors are challenging to parse. Despite the complexity here, however, the different stakeholders in the educational space would be well-served by developing greater awareness of how those digital ed tech affordances that are in use or contemplated for their learning environments deal with data.¹⁹

Participant Interconnectedness

Sharing of data in educational settings typically involves questions about privacy and safety, but of course is by no means always a negative state of affairs. Digital ed tech services and devices—as part of the larger suite of digital technologies that play an increasingly important role in youth’s lives—facilitate “interconnectedness and engagement” between students across the different (individual, social, and formal) spheres of learning and across geographic boundaries, as well as among students, educators, parents, and other stakeholders.²⁰ For instance, students in a small rural school might participate in an open online course with students in an urban one and work on a project that encourages them to increase their civic engagement by contacting governmental leaders. Increased interconnectedness is also occurring between other stakeholders, both internal to and transcending geographic spheres; for example, parents and teachers may be able to be in better communication.

In what might first appear to be a paradox, this deepening capacity for participant interconnectedness offers opportunities to strengthen protected zones of student privacy and related values. These opportunities arise by protecting one or more facets of a youth’s identity or interests from the people and institutions who know them in person while still empowering youth to explore these domains. Key areas of such opportunity may include digital technologies that facilitate access to supportive networks for youth from underserved communities outside of their brick-and-mortar schools; opportunities for youth to engage in civic affairs or activism; and access for youth to research or pursue educational or professional pathways with which those in their community be unfamiliar or even opposed.²¹ In these and similar ways, familiar digital tools (including search engines and social media) and emerging ones (such as niche platforms to promote youth activism)²² may open up not just learning environments but the lives of individual students to new, exciting, and perhaps life-sustaining possibilities that grow up side by side with privacy and related perils.

Increased Role of Data Analytics

Digital ed tech is softening geographic demarcation lines and more traditional boundaries between roles and relationships in learning ecosystems. It is also drastically reducing limits on the type and volume of data that can be collected about students. As already mentioned, these tech affordances are capable of gathering an unprecedented amount of fine-grained data about students and using it for an ever-expanding range of purposes by educators, private tech companies, governmental agencies, and other actors.

Digital ed tech promises increased knowledge of and ability to engage with the individual student learner to personalize learning experiences to maximize success. Data analytics and related fields have become crucial to achieving this goal of “personalized learning.” Broadly speaking, this concept refers to educational experiences that are calibrated to each learner through algorithmic or other machine-based actions. Proponents tout it as a resource-effective means of promoting student success.²³ Critics express concerns that such claims are overblown and that—even if personalized learning may be able to succeed—*forfeiting human-centered pedagogy may outweigh the benefits.*²⁴

Regardless of the normative perspectives on personalized learning and other learning modalities enabled by digital ed tech, there are descriptive takeaways that are necessary to appreciate the full picture of student privacy in the digital era. Digital ed tech relies on large amounts of students’ private data in order to deliver educational experiences.²⁵ A practical example illustrates the point: A reading app, like digital ed tech in general, is designed to gather a vast amount of data both about individual students and cohorts of students. If this app can figure out that a student needs more time to master a given level of reading, for example, then the app can keep a student from progressing until she has attained that phase of mastery. To make this determination, the app is drawing both on finely calibrated individual data and also on a large data set of other student users’ experiences that provide the macro data-set needed to know how long it *should* take a student to identify the phonics. That is, in order to understand the individual student learner experience and progress, the app must also understand the cohort’s experience to determine appropriate benchmarks for progress. Thus new and emerging digital technologies, and the power of big data that they harness, lay the groundwork to make personalized learning and other educational innovations possible.

Lack of Clarity around Decision-Making

Privacy challenges and opportunities now arise regularly for teachers, administrators, and others. There are three main ways in which stakeholders in school systems may encounter student data privacy problems and, absent effective planning, each type of problem may contribute to institutional problems with effective decision-making within and between stakeholder groups. Painting with an intentionally broad brush to allow for the ongoing evolution of digital ed tech offerings and uses, these are as follows:²⁶ (1) Student digital data privacy can be breached by malicious third parties outside of the school, such as hackers. (2) It can be threatened by hostile or thoughtless actions of individuals within

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school systems; for instance, a teacher may put a post about his students on social media, only to have an estranged parent of one of the students see the post and learn information about the student that jeopardizes that student's safety. (3) It can be violated by actors within school systems or third parties who have fully lawful access to the data but who use it in systemic ways that inadvertently may imperil youth privacy.

The first and second categories are more familiar and thus are not elaborated upon further. The third category may be the most difficult one of which to conceive, thus additional illustration follows. In this category, decision makers endeavor to use digital ed tech in constructive, systemic ways. Common scenarios in which educators confront decision points around digital ed tech include school administrators who want to outsource student records to cloud-based storage or a teacher who wants to use a commercial photo-sharing platform for student projects. Determining responsibility for key decision-making points—such as who should assess the privacy risks and educational benefits of these or other forms of digital ed tech; who should make the determination about whether, when, and how to use a given type of digital ed tech; and who should plan and manage any digital ed tech rollout, such as obtaining permissions from parents—is by no means straightforward.²⁷

In order to be best positioned to establish a decision-making process that provides effective protection for privacy, school administrators and teachers need to familiarize themselves with key basic information. How thorough is an educational system's understanding of what student data is being transferred, with whom it's being shared, how it is being used, why it is being used in that manner, and what safeguards are in place against additional uses by other entities? These and related questions can be answered satisfactorily; unfortunately, the answers do not tend to be available through a standard click-wrap agreement.²⁸ Finding the answers tends to require a team-based approach, bringing together pedagogical, legal, technological, and other forms of expertise to ensure the student data privacy. Fortunately, a growing body of guidance exists for decision makers, including best practice guides, blueprints for vendor contracts, and other "soft" (nonlegislative) resources.²⁹

Federal Legal Governance Framework and Governance Gaps

Ultimately, all decisions around understanding and protecting student privacy are bound by a federal legal framework, which unfortunately is largely grounded in the brick-and-mortar era. The big three federal student privacy laws—the Family Educational Rights and Privacy Act (FERPA),³⁰ the Children's Online Privacy Protection Act (COPPA),³¹ and the Protection of Pupil Rights Amendment (PPRA)³²—did not anticipate the speed and scope of today's digital ed tech revolution, nor are they proving to be particularly adept at keeping pace with it. There is some meaningful movement around legislative reforms at both the federal and state levels, as discussed further in the following; however, on

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both levels, the legislative toolkit has proven to be inadequate for establishing comprehensive and consistent student privacy protections across the country.

Traditionally, controlling the outward flow of student information served to foster a protected learning environment in which students could make—and learn from—mistakes without fear that these errors would follow them. However, as schools themselves increasingly employ data-driven decision-making, the presumptions of the threat model that these big three student privacy laws aim to guard against no longer hold as true as they did in the past. Now, student information can stay “private” within the terms of the law but still be used to make recommendations or decisions about opportunities for students in ways that may prove very limiting to students’ horizons.

The tectonic shifts set forth earlier are creating intense pressure points on the brick-and-mortar-era framework. Fissures are emerging around the following key issues: which decision maker(s) are best positioned to determine whether, when, why, and to whom students’ data should be shared outside the school environment; what types of data may be unregulated by the big three privacy laws; and whether protecting privacy serves to protect related values, such as equity, agency, and autonomy.

The analysis that follows in this part identifies those key components of each law that are relevant for understanding these fissures in the student digital data privacy legal regime. The analysis then turns to unpacking the major fissures, flagged briefly earlier, in the federal legal framework for student privacy protection for the digital era. This legal description and analysis is intended to serve as a high-level map of the most relevant federal statutory and regulatory landscape for student data privacy today. For an individual school system, the navigation challenges here are typically best approached in the context of an interdisciplinary team—including educators, technologists, and legal counsel.

Family Educational Rights and Privacy Act (FERPA)

When most educational stakeholders think about student privacy law, the Family Educational Rights and Privacy Act (FERPA)³³ comes first to mind. Enacted almost a half-century ago, FERPA applies to all “public and private [educational agencies] or institution[s]’ that receive funds through particular programs administered by the Secretary of Education.”³⁴ Public primary and secondary schools are covered by this definition. In addition to its expansive reach, FERPA wields a cudgel: it “prohibits the federal funding of educational institutions ... that release educational records to unauthorized persons.”³⁵ To date, it does not appear that any educational agency or institution has lost its federal funding due to a FERPA violation.³⁶ But this is one race that no entity wants to win.

To maintain compliance with FERPA, schools³⁷ must maintain the “confidentiality of ‘education records.’”³⁸ Here again, broad construction is used; education records “include any records, files, documents, or other materials that are ‘maintained by an educational agency or institution or by a person acting for such agency or institution’ and contain information directly related to a student.”³⁹ Most familiar types of student data easily come under this umbrella, such as contact information and grades.⁴⁰ There are also a handful

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of specific types of material generated in the regular course of school life that are not considered an education record, such as a teacher's notes for limited personal use and employee records.⁴¹

In order to carry out their professional functions, educators within a school must frequently access "personally identifiable information (PII)" from these educational records.⁴² PII follows FERPA's familiar all-inclusive approach to definitions, including students' names, addresses, Social Security numbers, biometric identifiers, and "any other facts that would make it possible for an average person in a given community to figure out a student's identity."⁴³ Many types of digital ed tech require PII in order to function. Think back to the student who is learning math on an app instead of an abacus or even a calculator. In order to have an individual user account on that math app, the app provider likely will need—at a minimum—that student's name, contact information, and date of birth or grade level.⁴⁴

What does FERPA require in order for the school to give that app provider this PII? In order for a school to release PII to an outside individual or entity, it needs to obtain parental consent beforehand—subject to some exceptions.⁴⁵ Parents are charged with being the primary gatekeepers for whether, when, how, and why private information about their children may be shared outside of a school system. The baseline presumption is that schools aren't lawfully permitted to share any such private information absent parental consent—unless a specific legal exception applies and gives them permission to do so. The exception on which most schools are likely to rely to transmit PII to a digital ed tech provider is the "legitimate school official" exception.⁴⁶ It allows a school to share PII without prior parental consent when "outsourcing services to a third-party service provider ... who is under the school's 'direct control' and performing services for which school officials would otherwise be responsible," and that third party is not "turning around and sharing the PII with anyone else or using it for purposes beyond the scope of those" the school has explicitly permitted.⁴⁷

As discussed earlier, schools are using digital ed tech providers to perform a range of functions that otherwise would be done by school staff. However, this setup alone does not suffice to share PII without parental consent. In practice, it is difficult—if not impossible—to share PII in a FERPA-compliant way under the "legitimate school official" exception without a strong contract in place between the school and the digital ed tech provider. The contract—whether it be negotiated or entered into through a mechanism in which student data privacy essentially has been collectively negotiated ahead of time—must require the digital ed tech provider to "manage the data as if it were the school itself ... [and] only use it for the original purpose for which it was shared."⁴⁸

This requirement of strict contractual control is in tension with the culture around digital tech in general, not just in schools. Digital tech promises fast and easy solutions, with the legal plumbing typically tucked out of sight. Even when a user tries to peek underneath, the standard privacy, terms of use, and other policies are difficult to parse and seldom offer meaningful protection. But FERPA puts schools in a potentially tight spot: obtaining

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prior parental consent every time a teacher wants to use an app, an administrator wants to switch to a third-party cloud-based storage system for record-keeping, and so on constitutes an assignment likely destined for failure. However, relying instead on the legitimate school official exception risks having the exception swallow the central promise of the rule: parental oversight and control. FERPA also leaves students boxed in when it comes to protecting privacy-related values—such as equity, autonomy, and agency—because it is essentially silent on any consideration of these values. While there have been efforts at federal legislative reform—both of FERPA itself and of creating new federal law in this space—none has resulted in replacing or displacing FERPA.⁴⁹ Arguably the most successful recent reform effort in the federal legislative space has occurred not with FERPA but with the Children’s Online Privacy Protection Act.

Children’s Online Privacy Protection Act (COPPA)

When schools themselves want to share private information about students with digital ed tech providers, they look primarily to FERPA as the source of federal legal requirements. However, when schools want to have students share information directly with digital ed tech providers or when a school is using a commercial platform for a classroom project, then the first source of federal statutory and regulatory authority to which they must turn is the Children’s Online Privacy Protection Act (COPPA).⁵⁰

COPPA is a product of the 1990s and, unlike FERPA, written in the early internet era. Indeed, COPPA has kept much better pace with the evolution of the internet era than its federal student privacy law companions: the regulations that implement COPPA were updated in 2013.⁵¹ This regulatory reform, which included “expanding COPPA’s reach to mobile application developers and third-party vendors,” represents a pragmatic and timely response to “the increased use of the Internet by children in the mobile and social networking era.”⁵²

COPPA also differs from FERPA in two other structural ways: (1) it applies only to children under thirteen, and (2) it applies to certain categories of “online service providers,” regardless of whether they are providing online services in a school setting or not.⁵³ The providers covered are those that offer a “commercial website or online service” that collect “personal information” from children under thirteen and are either “directed to children” under thirteen or are for a “general audience” but have “actual knowledge” that the website or service collects such personal information from this cohort.⁵⁴ The Federal Trade Commission does promote choices by “operators to protect information collected from teenagers aged 13 and over as well.”⁵⁵

Moving from COPPA’s structural terms to its definitional ones, another key difference from FERPA comes into focus: the difference between PII (under FERPA) and personal information (PI) (under COPPA). PII and PI have some significant overlap but are “not equivalent.”⁵⁶ PI “includes names, addresses, Social Security Numbers, IP addresses, photos, and ‘any other information that permits the physical or online contacting of a spe-

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cific individual.”⁵⁷ PI also includes a “persistent identifier that can be used to recognize a user over time and across different websites or services.”⁵⁸

An operator covered by COPPA must, in almost all circumstances, “obtain verifiable parental consent prior to collecting, using, or disclosing any child’s personal information.”⁵⁹ This legal requirement is imposed on the operator, not the school itself. However, schools do have a meaningful role to play in COPPA’s schema. “Schools may consent on parents’ behalf [to students’ sharing their PI with a covered operator] when the collection, use, or disclosure of personal information from the students is conducted solely for the school’s benefit.”⁶⁰ In order to ensure that the operator is in fact collecting PI only for the school’s benefit—such as enrolling students in a given class in the same math app—the school should have an explicit agreement in place with the operator.⁶¹ Schools here are effectively bypassing the opportunity and process for parents themselves to consent to uses of their children’s private information, as is the case when they rely upon the legitimate school official exception under FERPA. When schools effectively make privacy decisions on parents’ behalf, they must ensure that they are doing thorough due diligence. Here again, as with FERPA, it is a challenge to determine from an interrelated technical and legal perspective whether data collection is in fact occurring and, if so, whether schools can make the decision to authorize this collection as substituted decision makers for parents. There is also continued silence on establishing a zone of privacy in order to uphold a space for agency, autonomy, and equity concerns.

Protection of Pupil Rights Amendment (PPRA)

The Protection of Pupil Rights Amendment (PPRA)⁶² offers perhaps the most challenging test of all for educators and others trying to determine its application. The PPRA both predates and postdates the dawn of the internet; it became law in 1974 and was “expanded as part of the No Child Left Behind Act” in 2001.⁶³ The PPRA is poorly drafted in places and, perhaps as a result, seems to be overlooked frequently by schools, digital ed tech providers, and other stakeholders in circumstances where it might apply to new and emerging digital ed tech. Fortunately for those trying to study up for the PPRA test, the range of such circumstances is narrower than either FERPA or COPPA.⁶⁴ Of course, neither the difficulties of the law nor its specificity constitute legitimate excuses for failure to comply.

The PPRA’s original focus was on “surveys, analyses, or evaluations administered through any program” receiving U.S. Department of Education funding.⁶⁵ Most significantly, the PPRA requires prior parental consent and opt-out opportunity whenever any such instrument is going to involve questions about “protected information (PrI).”⁶⁶ PrI encompasses a set of eight specific types of private information, all of which are highly sensitive, such as “political affiliations,” “mental or psychological problems,” and “religious practices, affiliations, of beliefs.”⁶⁷ Thus when a school or other covered actor plans to use a digital ed tech provider that offers a service that could qualify as a survey, analysis, or evaluation under the PPRA—and that service will be collecting PrI—then the PPRA applies. Especially as digital ed tech moves further into topics outside of ‘reading, ‘riting, ‘rithmetic, and

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into “soft-skills” around behavior and emotional self-regulation, prior parental consent is required under the PPRA.

In its twenty-first century expansion, the PPRA imposed “additional obligations on K-12 institutions to implement certain [new] policies regarding surveys conducted on students.”⁶⁸ Of this additional set of responsibilities, “[m]ost relevant with respect to [digital] networked services, the PPRA imposes obligations on activities that involve collecting, disclosing, or using students’ personal information for marketing or sales purposes.”⁶⁹ These activities go beyond surveys, analyses, or evaluations. Public primary and secondary schools “must offer parents an opportunity to opt out from having their child participate in any activity involving the collection, disclosure[,] or use of students’ personal information for the purpose of marketing or selling the information ‘(or otherwise providing that information to others for that purpose).’”⁷⁰ Thus public K-12 schools are effectively tasked with determining from all digital ed tech providers whose “activities” address PFI whether they will use (or give to others, such as data brokers) PFI for marketing or similar purposes. In this specific circumstance, schools cannot step in and substitute their own consent for parental consent.

Major Fissures in the Federal Student Privacy Law Framework

Today, the federal legal landscape created by FERPA, COPPA, and the PPRA contains several major weaknesses. First, the premise of parental consent, while strong in principle, is often on shaky ground in practice.⁷¹ This challenge may stem from schools’ failure to understand or comply fully with the parental consent requirement or the exceptions created by it. Schools often do not believe they need to get parental consent when they in fact do. Even when parental consent is not necessary because a legitimate exception to a parental consent requirement applies, schools often fail to correctly and fully follow the necessary steps to apply the exception. In both scenarios, actual parental or substituted (by the school) parental consent is bypassed. Even when parents are actually asked for consent, their capacity to do so effectively may well be limited. Parental ability to give meaningful consent is constrained because parents, as a group, likely are less well-positioned to understand the data privacy elements at play than are school systems, which ideally can employ a team-based approach that draws on different, relevant fields of expertise.

Second, none of these three laws was engineered to withstand the twists and turns of today’s digital ed tech terrain, although COPPA has kept up better due to its 2013 regulatory reform. In particular, the anchor of the “big three” (FERPA), was created almost a half-century ago, and its understanding of the educational landscape reflects the moment of its creation.⁷² FERPA’s creators could not have anticipated the ever-expanding range of digital tech options brought into schools and their multiplicity of uses. Today, even the threshold matter of a school system knowing what types of technologies are in use in their learning ecosystem, by whom, for what purposes, and on what terms is proving difficult. Notably, when FERPA was written, no one contemplated that students themselves could walk into the schoolhouse wearing a device, such as a fitness tracker, that would

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transmit information not just about them but potentially about their fellow students to vendors or others (such as participants in a social media or similar app) or that teachers could broadcast pictures of their classroom to the entire world with a few touches on the screen. Thus even before FERPA or any other federal student privacy laws can be applied, there is a nearly insurmountable challenge of knowing the actions undertaken by individuals in a school environment that send data outside that school, let alone managing them.

Even when school decision-makers are aware of the introduction of new technologies, schools and other stakeholders are left with a “square peg, round hole” type of situation as they try to determine whether the data produced by using that new tech affordance constitutes an “education record” such that any PII it contains is subject to FERPA protections. For instance, if schools require students to wear an IoT device, such as a movement tracker, for their physical education class, does the data that it generates constitute an “education record”? How about the metadata?⁷³ Especially in a big-data world where seemingly disconnected information can result in sensitive revelations, and the potential downstream uses of this data and the resulting revelations are not yet well understood, this lack of clarity in the anchoring federal student privacy statute can be unsettling for stakeholders.

Third, there are gaps where certain types of student digital data collection are not clearly regulated or actually are unregulated. These gaps are most dramatic when a third-party nonprofit entity is collecting data (that does not constitute PrI) directly from students. A digital tech provider that is noncommercial (so COPPA does not apply) could be given some very basic information about students under the directory exception to FERPA (name, some contact information), then collect data directly from students’ use of the digital tech without FERPA, COPPA, or the PPRA regulating. The same is true for a commercial digital tech provider that collects non-PrI data directly from students age thirteen and over: FERPA, COPPA, and the PPRA do not control this. This is not to say that such activities could ever take place in a lawless way. Laws of general applicability still apply, as do policies and practices established at the school, district, or state level. However, these outer boundaries of conduct (in the case of laws of general applicability) and relatively weak limits on conduct (in the case of policies and practices) do not supply as secure a foundation for protecting student privacy as does federal statute and accompanying regulation.

Fourth, the federal student privacy landscape does not meaningfully address the core principles closely related to privacy: autonomy, agency, and equity. While other legal schema may apply—for instance, antidiscrimination laws—given the multitude of ways in which data that is gathered and analyzed may be used to drive decision makers’ responses to youth, in the present and future, a comprehensive privacy schema would need to integrate in consideration of and protection for these layers of the broader privacy landscape.

Filling the Gaps: State Legislative and Nonlegislative Tools

These and related gaps in the federal legal and regulatory framework frequently create frustration for stakeholders. Without comprehensive, up-to-date, and user-friendly student privacy laws and regulations with nationwide authority, many stakeholders are left to make decisions against a backdrop of uncertainty, with potential negative consequences for the privacy protection of students. For example, the vendor community can be challenged by the patchwork nature of the federal framework as it seeks to develop products that can be marketed safely to schools across the country. Educators can feel anxious or even paralyzed when it comes to navigating student privacy, which may result in their decision to avoid even those ed tech offerings that offer solutions for their classrooms. Parents and students alike can become uneasy about the process for adoption and use of digital ed tech, which can lead to emotionally charged public discussions about youth privacy and related rights and opportunities in the educational context.⁷⁴

Many stakeholders continue to seek a solution to student data privacy challenges through comprehensive reform of federal statutes and accompanying regulations. While there have been some changes made at the federal legal level in recent years, a full overhaul of existing or the passage of new federal student privacy legislation continues to prove elusive.⁷⁵ Interestingly, this lack of movement persists despite the existence of proposed statutory reforms from across the political spectrum. This inaction seems to reflect the complexity of the challenge, as well as the emotional valence of law reform aimed at children's private lives. The remainder of this section looks at the use of state legislation as a reform tool, then unpacks nonlegislative approaches, concluding that a "blended" governance approach is necessary for creative, nimble, and effective privacy problem-solving.

Filling the Gaps I: State Legislation

Federal statutes and regulations are of course not the only type of law-based governance tool that can be used to address student digital privacy challenges and opportunities. State legislatures have been a particularly active site of law reform activity in the student privacy space for roughly the past half-decade.

In recent years, state legislatures have stepped in to try to address gaps in the federal legislative student privacy framework. Between 2013 and 2018, 118 new state student privacy laws were passed that apply to one or more of the following stakeholders: public K-12 schools, local education agencies (LEAs, such as school districts), state education agencies (SEAs, such as state boards of education), or digital ed tech vendors.⁷⁶ These nationwide reform efforts are generating a vast, varying, and ever-growing body of law, a full exploration of which is beyond the scope of this chapter. Key takeaways about this method of gap-filling are set forth in the following.

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Notably, in these state law reforms, the vendor community has been receiving a high degree of new legislative oversight. This focus is a reasonable response to what is arguably the most glaring gap in coverage for the big three federal student privacy laws: the relative absence of laws speaking to vendors themselves. On the federal level, only COPPA directly legislates ed tech vendor activities. In contrast, forty-three of the new state laws apply to vendors plus one or more of the familiar K-12 educational players (K-12 schools, LEAs, SEAs), and three apply only to vendors.⁷⁷ Taken together, these two categories represent close to 40 percent of the new state student privacy laws in the K-12 public education space.

Among these new vendor-inclusive legislative schemes, common limitations or full prohibitions include those on: profiling students based on the data collected; selling data about students to third parties; and targeting advertising to students based on data collected.⁷⁸ Some of these use-focused restrictions are tailored to permit activities with a more direct tie to education; for example, Virginia's legislative scheme for vendors carves out those ed tech services used for "college and career readiness assessment."⁷⁹

The new legislative provisions regulating the governmental entities in the public K-12 space—including schools themselves, LEAs or SEAs—also reflect a growing interest in regulating the vendor community. In this context, the focus is on reshaping the terms of the relationships between private ed tech providers and public institutions, rather than the activities of the providers. This goal has been pursued through straightforward means, such as requiring public educational entities to put in place contracts containing certain data privacy terms when working with private vendors.⁸⁰ More subtle means have also been employed, such as creating new public positions focused on data privacy—with titles such as chief privacy officer—such that there will be ongoing governmental awareness of and engagement with provider activities, as well as other spheres of student data privacy activity.⁸¹

However, the implementation of vendor-focused and all other privacy-protecting measures has not always been linear or efficient. For example, New York passed a law mandating the creation of a new chief privacy officer position (at the state level) in 2014, but the first holder of the new office did not start for two years.⁸² This instance of an implementation challenge surfaces a broader point: As states have created many meaningful new privacy protections, they have also created new challenges that go beyond implementation. These include an increasingly patchwork student privacy law framework around the country, which leaves some students underprotected or unprotected and may deter ed tech innovation and thoughtful data use as stakeholders navigate a heterogeneous national landscape.⁸³ Challenges also include limitations in the scope of coverage within some states; laws may exclude vendors of generally available products and services from new vendor-focused privacy measures,⁸⁴ for example, or define types of covered technologies so narrowly that emerging digital tech quickly falls outside the bounds of legislative oversight.⁸⁵ In these and similar respects, the "gap fillers" offered by state

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student privacy law reforms themselves leave gaps in privacy protections and invite interventions by other stakeholders using tools other than legislation.

Filling the Gaps II: Nonlegislative Fixes

School District Decisions

The nonlegislative toolkit includes action at the local level. Notably, some school district and other actors, such as those who have come together to create the Student Data Privacy Consortium,⁸⁶ have created impactful policies around standardized contractual language to ensure that the requirements for the legitimate school official exception under FERPA and other applicable legal and regulatory requirements are made part of contracts between a district and a third-party digital ed tech provider.

While laws and policies have a uniquely important role in protecting student privacy, through both their deterrence and norm-setting functions, governance approaches outside of the law and policy realms entirely are also important. Stakeholders (including but not limited to teachers, administrators, parents, students, vendors, lawmakers, regulators, policymakers, and other decision makers and actors) can employ tools from other governance domains, such as: tech-based; market-based; and human-centered.⁸⁷ Each of these domains is described briefly in the following, with a few representative examples of actions in each domain also listed. These examples are offered for illustrative, not best practice recommendation, purposes. Decisions to employ one or more techniques within one or more domains are highly specific to the values, norms, goals, customs, and practices of a given decision maker.

Technology-based Approach

Just as learning environments are increasingly looking to digital tech to facilitate learning, so too are they looking for digital tech to facilitate privacy. This governance approach turns to technologies themselves to “enhance student privacy by building access controls or usage restrictions into the ed tech products being used.”⁸⁸ Representative offerings—aimed typically at the district or school level—include the company Clever, a service that offers districts solutions to “manage and secure applications” and promises “full FERPA compliance for itself and vendors,”⁸⁹ as well as a “‘software platform’ from iKeepSafe and BrightBytes to ‘ensure school systems comply with new laws, but also go beyond compliance to create a healthy and positive digital culture.’”⁹⁰ However, as the range of digital ed tech continues to evolve to include a greater range of new technologies—such as IoT and AI-based technologies—the tech-facing solution space may grow increasingly difficult to employ as an exclusive or even primary response at the district or school level.

Market-based Approach

The technology-based approach discussed earlier often relies on the market mechanism for distribution—put simply, districts or schools need to buy and use these products. The market-based approach looks beyond use of markets for buying and selling products. Instead, this governance approach refers to those voluntary choices and commitments by ed tech companies to take measures to protect student data privacy beyond what is re-

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quired by federal law or other requirements imposed by a governmental mechanism. That is, technology-based solutions are tech products or services that exist to address privacy problems; market-based solutions are those that build in privacy commitments to general use ed tech products. A familiar example here is the voluntary Student Privacy Pledge, developed in 2014 by the Future of Privacy Forum and the Software & Information Industry Association, through which signatories represent that they will abide by a set of requirements to “safeguard student privacy.”⁹¹ While the Pledge and similar market-based tools are voluntary, it should be noted that a company that makes an affirmative pledge to consumers to act in a certain way could be liable under state or federal unfair and deceptive acts and practices statutes, as well as other legal schema, if that pledge is then violated. In this fashion, then, a market-based mechanism could wind up with law-based enforcement.

Human-centered Approach

Law is, of course, not self-enforcing. At least at this stage of AI development, humans must still be enlisted for any enforcement efforts. But human-centered approaches are not looking to humans to engage in policing of any sort. Rather, this category encompasses “mechanisms that rely on one or more forms of interpersonal engagement.”⁹² Increasingly, this governance approach is seeing the creation of curricula and other educational materials through which parents, students, and other stakeholders may learn from and with one another about student data privacy—both in terms of awareness of the challenges as well as instruments available aimed at ensuring appropriate levels of student privacy.⁹³ Social networks—both digital and brick-and-mortar—are also powerful sources of human-centered governance; for instance, parents who are nervous about or unhappy with a school district’s approach to digital data privacy might connect directly with one another to exchange ideas and organize.⁹⁴ However, parents who feel less empowered in a given context might be less able than their more connected counterparts to access this or other human-centered mechanisms.

Blended Approach

While human-centered connections may prove vital for interpersonal support and network building, it may be difficult if not impossible to confront the privacy challenges of the networked world of learning ecosystems without networking in more than one governance domain. Given the complexity of student data privacy challenges and opportunities, a “blended” governance approach—the “interrelated use” of one or more of the other mechanisms alongside law-based tools—often proves invaluable.⁹⁵ In addition, multistakeholder convenings, from the formal, large-scale, to the informal and more intimate, have been crucial to developing trust points, sharing information, and responding nimbly and strategically to the multidimensional challenges in the student privacy space.

Another example of blended governance with potential implications for student privacy awareness can be found in the passage of state laws that require that K-12 public schools provide instruction about “digital citizenship” to students. Through this pathway, educators, parents, and other actors are required (law-based) to engage in development of ped-

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agogy and translation of this pedagogy into practice (human-centered). In 2016, in its first-of-a-kind legislation in this space, Washington State defined digital citizenship as “includ[ing] the norms of appropriate, responsible, and healthy behavior related to current technology use, including digital and media literacy, ethics, etiquette, and security. The term also includes the ability to access, analyze, evaluate, develop, produce, and interpret media, as well as internet safety and cyberbullying prevention and response.”⁹⁶ Under this definition, “digital citizenship” encompasses everything from shopping to sexing—and beyond.

Conclusion

As adults continue to employ various governance measures to respond to student privacy and related challenges, it is imperative that they do not make decisions about digital privacy solely on their own. Contrary to frequent public perception, youth do very much care about their digital privacy. They have deeply held convictions and employ a range of sophisticated strategies to manage those aspects of their digital privacy over which they have some measure of control.⁹⁷

In order to ensure that student privacy frameworks align with students’ digital practices as well as privacy expectations, adult stakeholders should incorporate robust ways for youth to participate in the discussion about the best ways to tackle outstanding and future student data privacy challenges. There are both pragmatic and principled reasons to do so. From the pragmatic perspective, adults are likely to glean insights from youth contributions that will inform and ground the decision-making. From the principled view, many of the values that student privacy tends to be protecting implicitly—autonomy, agency, and equity—would be honored by including youth voices and perspectives, even if youth do not have the legal authority in most contexts to make binding privacy decisions.⁹⁸

Digital ed tech makes such participation easier to contemplate. Even potential future federal and state lawmaking and regulatory activities could have an expanded role for youth—examples might include a digital campaign to solicit input from students; a youth-focused listening session (remote and in-person) hosted by the U.S. Department of Education or other appropriate federal or state home; a youth advisory group within a school or government entity; a youth lab that would provide a physical space to discuss these issues on an ongoing basis; or a problem-solving group at the school involving different stakeholders. Through these and similar opportunities, the same expanding digital ed tech horizon that may create confusion or even unease around privacy also reveals itself as containing an ever-growing number of pathways toward youth-empowered solutions to privacy challenges.

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Notes:

(1.) Social scientists use a variety of terms to refer to youth, such as: youth, young people, minors, children, younger children and older children, prepubescent children, prepubescent youth, preadolescents, adolescents, teens, teenagers, younger teenagers and older teenagers, and older youth. A review of the literature suggests that these terms are used interchangeably in an ambiguous manner and that they do not carry with them a commonly accepted definition. For the purpose of this work, we are using the legal convention in the United States of referring to all legal minors (generally, individuals under the age of eighteen) as a working definition when referring to “youth” or “young people.” We choose to follow the institutional category of minors because, even if it is a social and legal construct, its social and legal effects fundamentally define and shape social experience.

(2.) *See generally* JOHN PALFREY & URS GASSER, *BORN DIGITAL: HOW CHILDREN GROW UP IN A DIGITAL AGE*, Ch. 9 (rev. ed. 2016); *See generally* MIMI ITO ET AL., *AFFINITY ONLINE: HOW CONNECTION AND SHARED INTEREST FUEL LEARNING* (2019).

(3.) As with many things digital, there is no single agreed-upon definition of digital educational technologies (also referred to interchangeably as “digital ed tech” or “ed tech”). Within the scope of this chapter, the term is used to refer broadly to “a range of services and devices that are connected through” digital networks “that educational institutions might employ.” Dalia Topelson Ritvo, *Privacy and Student Data: An Overview of Federal Laws Impacting Student Information Collected Through Networked Technologies*, CYBERLAW CLINIC AT HARVARD LAW SCHOOL 4 (June 2016), <https://dash.harvard.edu/handle/1/27410234> [hereinafter *Guide*]. Digital networks include any service, device, or other affordance that relies on network connectivity to gather, store, transmit, and use data.

(4.) For more information, go to <https://perma.cc/SX7U-22ZN>.

(5.) *See generally* DANIEL J. SOLOVE & PAUL M. SCHWARTZ, *PRIVACY, INFORMATION, AND TECHNOLOGY* 35 (2d ed., 2006).

(6.) JONATHAN ZITTRAIN, *THE FUTURE OF THE INTERNET—AND HOW TO STOP IT* 233 (2008).

(7.) JOHN PALFREY & URS GASSER, *BORN DIGITAL: HOW CHILDREN GROW UP IN A DIGITAL AGE*, Ch. 1 (rev. ed. 2016).

(8.) *See generally* Anne C. Dailey & Laura A. Rosenbury, *The New Law of the Child*, 127 *YALE L.J.* 1448, 1500-1503 (2018) (unpacking the underlying principles in family law that animate youth privacy debates).

(9.) Student Privacy Initiative, available at <https://perma.cc/7KVM-EPMF> (2018).

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(10.) See generally Leah Plunkett, Alicia Solow-Niederman, & Urs Gasser, *Framing the Law & Policy Picture: A Snapshot of K-12 Cloud-Based Ed Tech & Student Privacy in Early 2014*, BERKMAN KLEIN CENTER FOR INTERNET & SOCIETY 1, 5 (June 2014), <https://perma.cc/XY7V-Q5UN> [hereinafter *Framing the Law & Policy Picture*].

(11.) See Leah Plunkett & Urs Gasser, *Student Privacy and Ed Tech (K-12) Research Briefing*, BERKMAN KLEIN CENTER FOR INTERNET & SOCIETY NETWORKED POLICY SERIES 3-4 (Sept. 2016), Berkman Center Research Pub. No. 2016-15 (laying out this “ecosystem map”) [hereinafter *Student Privacy Research Briefing*].

(12.) It is important to note that there are arguably even more fundamental privacy issues that learners face when they are engaged with digital learning tools—in their individual and social spheres of learning—that are used outside of schools.

(13.) *Student Privacy Research Briefing*, *supra* note 11, at 3.

(14.) See *id.* at 3.

(15.) PALFREY & GASSER, *supra* note 2, at 2.

(16.) See generally *Student Privacy Research Briefing*, *supra* note 11, at 3-6.

(17.) See generally *Guide*, *supra* note 3, at 1.

(18.) See generally *Student Privacy Research Briefing*, *supra* note 11, at 5; Kevin Lapp, *Databasing Delinquency*, 67 HASTINGS L.J. 195, 212-216 (2015) (explaining how schools function as “informants” for the justice system).

(19.) See generally Leah A. Plunkett, Dalia Topelson Ritvo, & Paulina Haduong, *Privacy & Student Data: Companion Learning Tools*, BERKMAN KLEIN CENTER FOR INTERNET & SOCIETY 3 (Mar. 2017), <https://perma.cc/XL2Q-RXEA> [hereinafter *Companion Learning Tools*].

(20.) See *Student Privacy Research Briefing*, *supra* note 11, at 2-3.

(21.) See generally PALFREY & GASSER, *supra* note 2, at 22, 203-204, 229 (analyzing youth identity, youth as activists, and youth as learners); Joseph Kahne & Benjamin Bowyer, *The Political Significance of Social Media Activity and Social Networks*, 35 J. POL. COMM. 470-493 (2018) (concluding that more robust social networks for young people contribute to their political engagement).

(22.) See, e.g., ROCKEFELLER FOUNDATION, A NEW YOUTH ACTIVISM: TODAY’S YOUTH AND THE POWER OF INTERCONNECTEDNESS (2017) (“Specialized, issue-focused digital networks—which are designed to cater to the ways in which youth want to discuss issues while also giving youth the opportunity to decide what issues will be discussed—can reinforce the connections formed by social media and channel them into activism and action.”).

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(23.) See generally Monica Bulger, *Personalized Learning: The Conversations We're Not Having*, DATA & SOCIETY RESEARCH INSTITUTE 3–4 (July 2016), <https://perma.cc/C8YL-AD5K> (examining definitional criteria for and promises of personalized learning).

(24.) See *id.* at 11–19.

(25.) See *id.* at 16–17.

(26.) See *Framing the Law & Policy Picture*, *supra* note 10, at 20–21.

(27.) See *id.* at 9–12.

(28.) See *id.* at 13.

(29.) See generally *Student Privacy Research Briefing*, *supra* note 11, at 7 (mapping examples of this “soft” solution space).

(30.) 20 U.S.C. § 1232g.

(31.) 15 U.S.C. §§ 6501–6506.

(32.) 20 U.S.C. § 1232h.

(33.) 20 U.S.C. § 1232g.

(34.) *Guide*, *supra* note 3, at 2.

(35.) *Id.*

(36.) There is no private right of action under FERPA, thus parents and students cannot enforce FERPA's privacy protections through litigation. *Gonzaga Univ. v. Doe*, 536 U.S. 273, 276 (2002).

(37.) For brevity, the big three statutory description sections offer descriptions at the school level, although the analysis typically will apply in the same or similar manner to other institutional layers in the education system (such as a school district or state agency).

(38.) *Guide*, *supra* note 3, at 2.

(39.) *Id.*

(40.) *Id.*

(41.) *Id.* at 3.

(42.) *Framing the Law & Policy Picture*, *supra* note 10, at 11–12.

(43.) *Guide*, *supra* note 3, at 4.

(44.) *Id.*

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(45.) *Id.*

(46.) *Id.* at 7.

(47.) *Framing the Law & Policy Picture*, *supra* note 10, at 12-13.

(48.) *Guide*, *supra* note 3, at 7.

(49.) See Elana Zeide, *Student Privacy Principles for the Age of Big Data: Moving Beyond FERPA and FIPPS*, 8 DREXEL L. REV. 339, 379 (2016).

(50.) 15 U.S.C. §§ 6501-6506.

(51.) 16 C.F.R. § 312 (2013).

(52.) David R. Hostetler & Seiko F. Okada, *Children's Privacy in Virtual K-12 Education: Virtual Solutions of the Amended Children's Online Privacy Protection Act (COPPA) Rule*, 14 N.C. J.L. & TECH. ON. 167, 168 (2013).

(53.) *Guide*, *supra* note 3, at 9.

(54.) *Id.*

(55.) *Id.* at 10. The FTC enforces COPPA; like FERPA, COPPA contains no private right of action. See DANIEL J. SOLOVE ET AL., *PRIVACY, INFORMATION, AND TECHNOLOGY* 224 (2006).

(56.) *Framing the Law & Policy Picture*, *supra* note 10, at 14.

(57.) *Id.*

(58.) *Guide*, *supra* note 3, at 10.

(59.) *Id.* at 11 (emphasis in original removed).

(60.) *Id.* at 13 (emphasis in original removed).

(61.) *Id.*

(62.) 20 U.S.C. § 1232h.

(63.) *Guide*, *supra* note 3, at 16.

(64.) Like FERPA and COPPA, there is no private right of action under the PPRA. See, e.g., *C.N. v. Ridgewood Bd. of Educ.*, 146 F. Supp. 2d 528, 535 (D.N.J. 2001), *aff'd in part, rev'd in part*, 281 F.3d 219 (3d Cir. 2001).

(65.) *Guide*, *supra* note 3, at 16.

(66.) *Id.*

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(67.) *Id.*

(68.) *Id.*

(69.) *Id.*

(70.) *Id.* at 18.

(71.) *See id.* at 7.

(72.) *See, e.g., Zeide, supra* note 49, at 354 (describing state of student data transfer at time of FERPA's enactment).

(73.) *Guide, supra* note 3, at 3.

(74.) *See Framing the Law & Policy Picture, supra* note 10, at 3.

(75.) *See, e.g., Zeide, supra* note 49, at 379.

(76.) The information in this section is current through summer 2018, as reported by FERPA SHERPA. *See FERPA SHERPA, State Student Privacy Laws* (2018), available at <https://perma.cc/6CL8-W5S2> (chart listing applicable state reforms). The examples in this section are representative rather than exhaustive; providing a comprehensive mapping of the state student privacy legislative scheme is beyond the scope of this chapter. Of the 125 total state student privacy laws passed in this period, seven applied only to higher education. None applied to early education alone.

(77.) *Id.*

(78.) Examples of each type of new state law include (1) profiling—Iowa, Maryland, Michigan; (2) selling—Kansas, Washington; (3) targeting—Iowa, Virginia, Delaware. *See FERPA SHERPA, supra* note 76. An exhaustive list is beyond the scope of this chapter.

(79.) Va. HB 750 (2016).

(80.) Contractual provisions in related areas, such as security, may be required also. Examples of jurisdictions taking this approach for one or more types of public entity include Connecticut, Michigan, Nevada, and North Carolina. *See FERPA SHERPA, supra* note 76.

(81.) *See, e.g., Ark. HB 1793* (2017).

(82.) Press Release, N.Y. Dept. of Ed., *State Education Department Appoints Temitope Akinyemi as Chief Privacy Officer* (2016), available at <https://perma.cc/H7M6-HTJY>.

(83.) *See generally* Data Quality Campaign, *Education Data Legislation Review: 2018 State Activity* (Oct. 18, 2018), available at <https://perma.cc/8G8P-98EB>.

(84.) *See, e.g., Nev. AB 7* (2016).

(85.) *See, e.g., Hawaii SB 2607* (2016).

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(86.) For more information, go to <https://perma.cc/4T55-VSXT>.

(87.) This toolkit and accompanying examples was first laid out in the *Student Privacy Research Briefing*, *supra* note 11, at 6-8.

(88.) *Id.*

(89.) *Id.*

(90.) *Id.*

(91.) *Id.*

(92.) *Id.*

(93.) *Id.*

(94.) *Id.*

(95.) *Id.* at 7.

(96.) WASH. REV. CODE § 28A.650.

(97.) See Sandra Cortesi et al., *Youth Perspectives on Tech in Schools: From Mobile Devices to Restrictions and Monitoring*, BERKMAN KLEIN CENTER FOR INTERNET & SOCIETY 1, 5 (Jan. 2014).

(98.) See Urs Gasser, *A Call for the Enhanced Engagement of Children in the Digital Rights Discourse*, UNICEF (2014), available at https://www.unicef.org/publications/files/CRC_at_25_Urs_Gasser_13Oct2014.pdf.

Leah Plunkett

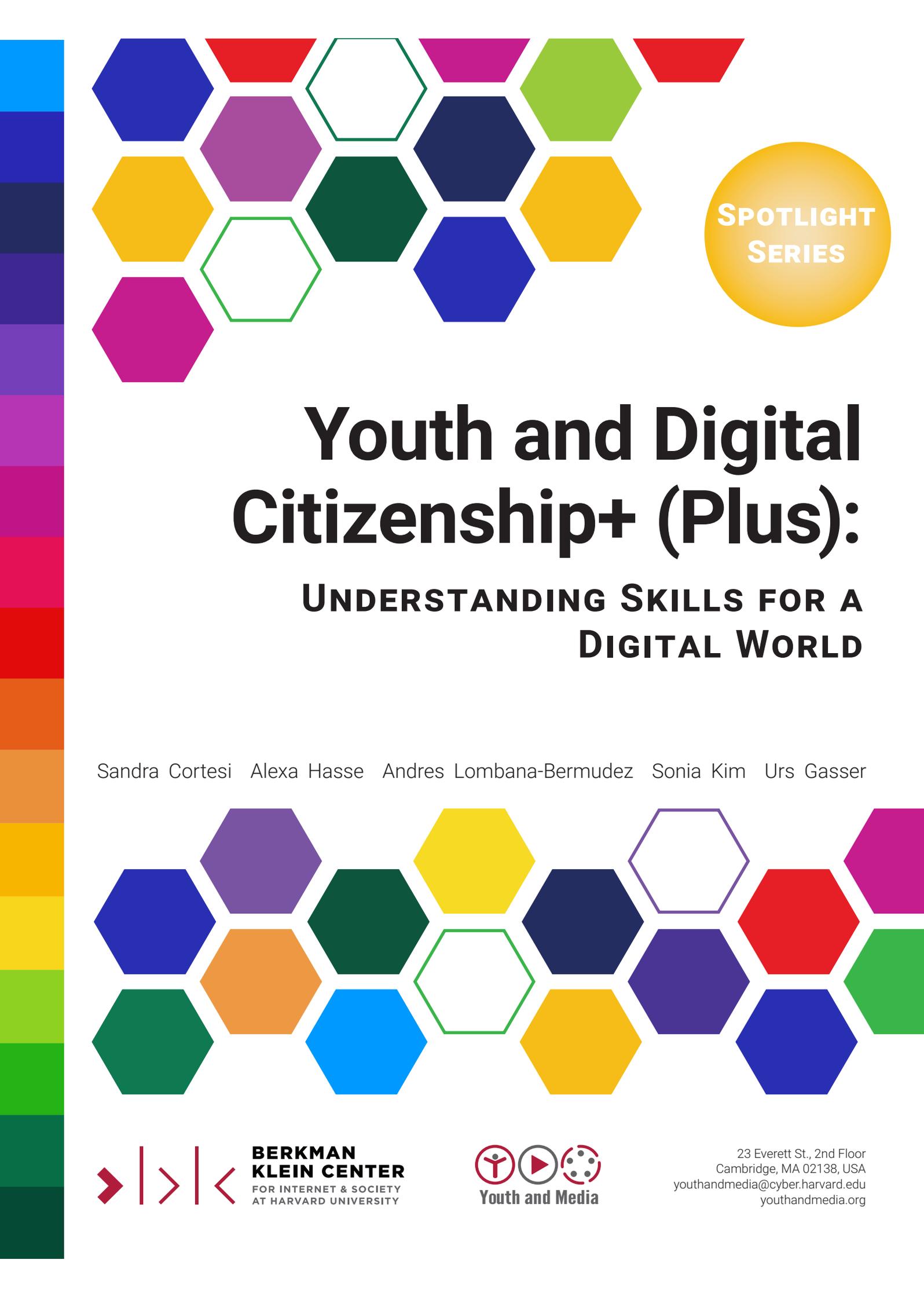
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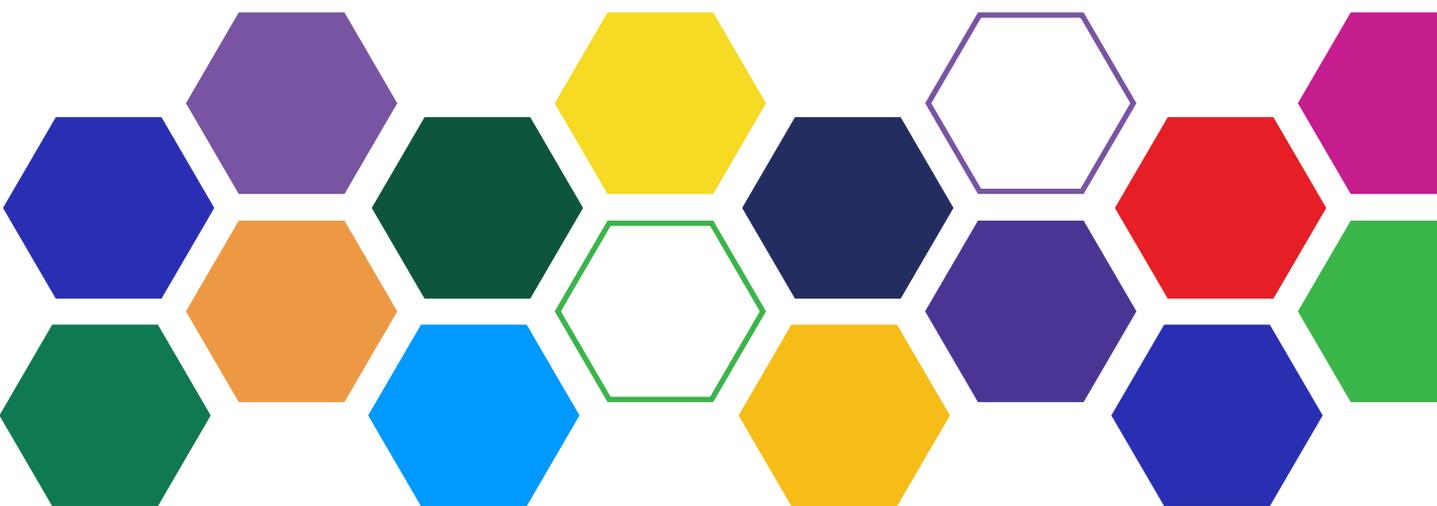


SPOTLIGHT
SERIES

Youth and Digital Citizenship+ (Plus):

UNDERSTANDING SKILLS FOR A DIGITAL WORLD

Sandra Cortesi Alexa Hasse Andres Lombana-Bermudez Sonia Kim Urs Gasser



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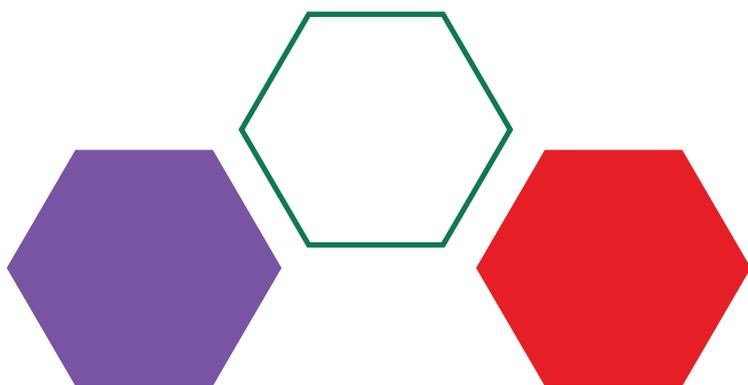
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Youth and Digital Citizenship+ (Plus): Understanding Skills for a Digital World

By Sandra Cortesi, Alexa Hasse, Andres Lombana-Bermudez, Sonia Kim, & Urs Gasser.

Digital citizenship has become a topic of growing importance among academics and policymakers alike, at the center of debate and theorization around the skills youth need to navigate and actively participate in our digital world. On a global level, a variety of stakeholders — including government, international organizations, non-governmental organizations, and academia — have adopted the term to develop and shape formal and informal learning programs that aim to help youth address the challenges and embrace the opportunities the digital environment may present. Yet, there is little consensus as to the broad areas (e.g., safety and well-being, civic and political engagement, identity exploration), and skills within them, digital citizenship should encompass. In this spotlight, Youth and Media explores the concept of digital citizenship, providing an overview of the current dialogue surrounding the term, with a focus on several key questions. Why does digital citizenship matter? Why has the concept become central in discussions about youth (ages 12-18), education, and learning in the 21st century? In a world where the online and offline are increasingly blending, to what extent should we emphasize the role of the “digital” in “digital citizenship”? To what degree do youth feel connected to the term “citizen?” How is the concept of digital citizenship similar to or different from other concepts, such as digital literacy or 21st century skills? How should we approach these concepts to more effectively foster the skills youth need to thrive in today’s society? And to what extent have we as decision-makers, academics, and educators been successful at incorporating youth voices in the development, implementation, and evaluation of digital citizenship initiatives?

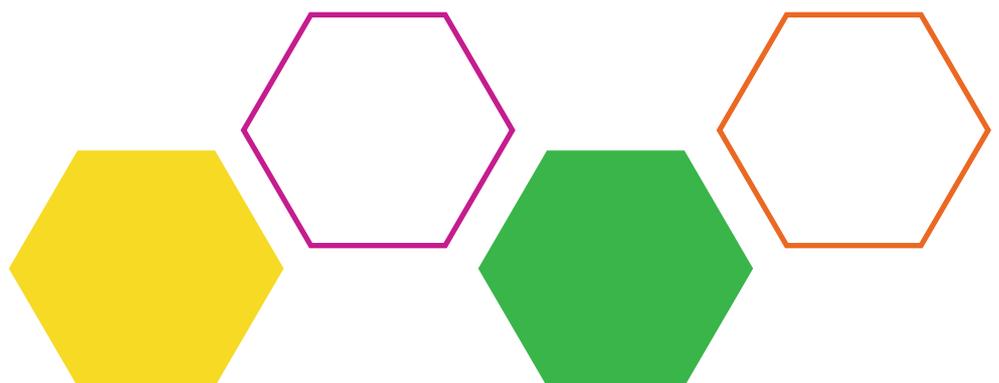


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0. READER'S GUIDE: CONTEXT AND PURPOSE

Over the last five years, the Youth and Media (YaM) team at the Berkman Klein Center for Internet & Society at Harvard University has engaged in and supported numerous efforts related to youth (ages 12-18)¹, digital technologies, and learning. Some of these efforts included traditional research, while others were more focused on education and community building.²

Throughout the years, but recently with more frequency, individuals from various sectors (government, international organizations, non-governmental organizations (NGOs), and academia) have come to us with questions such as “How do you define media literacy and how do you think it’s different from **information** or **news literacy**?,” “Is there a difference between ‘digital citizenship’ and ‘digital literacy?’,” “Do these two concepts address the same skills?,” and “Is the focus of digital citizenship civics, safety, or something else?” Concurrently, YaM has been developing a **significant number of educational resources** empowering young people in the digital world. We wanted to better understand if these educational resources are in fact addressing the topics most relevant to youth or whether there are gaps that we need to close. Taken together, these conceptual and practical questions motivated us to pause and take stock of the status of the vibrant and at times fragmented debate about digital citizenship,

literacies, skills, competencies and related terms and concepts, with the goal to come up with a clearer understanding of the current landscape and translate the findings from such a stock-taking into a set of actionable take-aways that would inform our collective work in this thematic area.

This spotlight captures what we have learned in this review and contains six key parts that highlight the evolving discourse around what we capture under the umbrella term “digital citizenship” (more on terminology momentarily) and considerations related to the development and deployment of this concept. We hope this snapshot is helpful to a diverse group of readers including policymakers, educators, parents or caregivers, or people involved in the development of a digital citizenship framework or any related concept.

In part I, we explain why we use “digital citizenship” as an anchoring concept. We first offer readers a brief overview of the youth and media discussion trajectory. We then explore various ways digital citizenship has been conceptualized by scholars in the field and applied in formal educational settings around the world. Next, we examine the benefits and drawbacks of this term from an objective and subjective lens. From this discussion, we propose the modified term “digital citizenship+ (plus)” (which we expand as a framework in part III of this spotlight) and our rationale behind it.

¹ People use a variety of terms to refer to youth, such as: “youth,” “young people,” “minors,” “children,” “younger children and older children,” “preadolescents,” “adolescents,” “teens,” “teenagers,” “younger teenagers and older teenagers,” and “older youth.” We have adopted the convention of referring to all legal minors (generally, individuals under the age of 18 in U.S. law) as “youth.” We choose to follow the institutional category of minors because of its common social and legal aspects (e.g., legal adulthood — when parents lose parenting rights and responsibilities regarding the person concerned, most common voting age). For more information, please see *Youth and Digital Media: From Credibility to Information Quality*.

² For more information, please visit <http://youthandmedia.org> and <https://dcrp.berkman.harvard.edu>.

In part II, we turn our attention to concepts related to digital citizenship that address young people's skill development in the context of digital media. Much like digital citizenship, each of these concepts — digital literacy, media literacy, new media literacies, 21st century skills, and digital competence — are typically associated with frameworks and accompanying learning materials that aim to help individuals address the challenges and embrace the opportunities associated with our digital world. We envision that this section will provide readers with an understanding of some of the general ideas included in each of these concepts, while also acknowledging that the overall landscape of these concepts is quite complex. Many of the frameworks within a given concept diverge in terms of the skills they address. There is also a great deal of overlap among skills when looking across these concepts.

While we have decided to introduce and use the term “digital citizenship+ (plus),” we want to be mindful of how others in government, international organizations, NGOs, and academia have created and applied their own frameworks around digital citizenship and its related skills. In part III, we describe the process by which we mapped a set of 35 frameworks (illustrated in a visualization) that address digital citizenship or other concepts, such as media literacy or online safety. We then showcase the results from this mapping exercise — the 17 areas of life in our digital citizenship+ (plus) framework, which we propose future frameworks on digital citizenship, and similar concepts, should address. Additionally, we suggest a possible way to group these 17 areas, as well as how these areas might be applied in practice, particularly within the educational space.

In part IV, we offer several observations and considerations, based on the mapping process described in part III, that may be helpful in the development and deployment of frameworks addressing digital citizenship or a related concept. These considerations concern 1) the specific term(s) one uses to describe how an individual masters an area of life related to the digital world (e.g., skills, literacies, abilities, etc.) and how the term(s) relates to the overall goal of the framework; 2) the interconnected nature of areas of life related

to the digital environment; 3) the importance of contextual factors of relevance — such as age, ethnicity, race, gender and sexual identity, religion, national origin, location, skill and educational level, and/or socioeconomic status — in how frameworks are conceptualized and applied; 4) the value of approaching digital citizenship in a balanced manner that accounts for both the challenges and the opportunities youth encounter online; 5) the inclusion of youth in developing frameworks and examples of forms this participation may take; and 6) the importance of actionable efficacy data.

In part V, we narrow our focus in on three specific areas of life that we noticed were rarely explicitly included in the frameworks we explored in our mapping exercise detailed in part III: data, computational thinking, and artificial intelligence. In this part V, we explore formal and informal educational initiatives around each of these three areas in the hopes of fostering additional dialogue around how the areas can be further incorporated into digital citizenship efforts.

Finally, in part VI, we feature two supplementary reading materials. First, we discuss how young people's access to and experiences with using digital technologies vary by demographic factors including gender, socioeconomic status, and race. Then — connecting gender with reflections around the underexplored areas of life detailed in part V— we present a brief overview of the gender gap in computer science. More specifically, we explore the computer science gender landscape both in and outside of the U.S. and describe some of the driving social and cultural forces that have contributed to the gender imbalance in this field, with a focus on the U.S. The section concludes by presenting formal and informal educational initiatives around the world that are working to address the gender gap in computer science.



I. A CLOSER LOOK AT DIGITAL CITIZENSHIP



Many different terms and concepts are used to describe, frame, and categorize the various skills that help youth make better use of digital technologies. For the purpose of this report, we decided to focus on the concept of digital citizenship. We wrote this part I to share the factors that have shaped this decision and the elements that continue to influence our thinking in this space. To provide context, section 1 begins with a brief overview of the youth and media discussion trajectory. In section 2, we present different theoretical conceptions of digital citizenship, starting with early definitions of the concept. In

section 3, we discuss how digital citizenship has been applied in the formal educational context in regions around the world. In section 4, we hope to convey why, given the adult-normative discourse around youth and citizenship, among other factors, we struggle with the term “digital citizenship.” In section 5, we describe why, in light of developments within formal and informal learning spaces, we have chosen to focus on digital citizenship. Finally, in section 6, we introduce our rationale for constructively tweaking “digital citizenship” and reframing the concept as “digital citizenship+ (plus).”

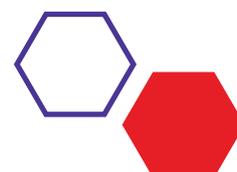
1. INTRODUCTION

For many of today's youth, the use of digital technologies has increasingly become a routine part of their daily lives. The growing prevalence, use, and agency of digital technologies has changed how young people socialize, communicate, play, and learn. These technologies have opened up a variety of ways for youth to participate (e.g., through video remixes or memes), create and innovate, and interact with those from different cultures and communities.

Initially, much of the public conversation around youth and digital technologies centered on assessing and understanding the risks and potential harms digital technologies may pose (e.g., Barbosa, 2014; Byrne, Kardefelt-Winther, Livingstone, & Stoilova, 2016; Gasser, Cortesi, & Gerlach, 2012; Hinduja & Patchin, 2009; Jones, Mitchell, & Finkelhor, 2013; Lenhart, Madden, Smith, Purcell, & Zickuhr, 2011; Levy et

al., 2012; Livingstone, Haddon, Görzig, & Ólafsson, 2011; O'Neill, Staksrud, & McLaughlin, 2013; Palfrey, boyd, & Sacco, 2010; Ybarra, boyd, Korchmaros, & Oppenheim, 2012).

This stance was later supplemented by a dialogue around the potential opportunities associated with young people's use of digital media (e.g., Banaji & Buckingham, 2013; Benkler, 2006; boyd, 2014; Brennan & Resnick, 2013; Cobo et al., 2018; Gasser, Cortesi, Malik, & Lee, 2012; Gray, 2009; Ito et al., 2008; Ito et al., 2010; James, 2014; Jenkins, 2019; Jenkins, Clinton, Purushotma, Robison, & Weigel, 2006; Jenkins, Ford, & Green, 2013; Jenkins, Ito, & boyd, 2015; Livingstone, Mascheroni, & Staksrud, 2015; Palfrey & Gasser, 2008; Rideout, 2015).



During approximately the last seven years, the predominantly risk-oriented policy conversation has turned into an increasingly holistic debate about the challenges and opportunities of digital technologies for youth and their interests (Gasser & Cortesi, 2017; Kleine, Hollow, & Poveda, 2014; Livingstone & Bulger, 2013; Palfrey & Gasser, 2016; Third, Bellerose, Dawkins, Keltie, & Pihl, 2014; Third, Bellerose, Diniz De Oliveira, Lala, & Theakstone, 2017; United Nations Children’s Fund [UNICEF], 2017). This evolving dialogue aims to consider the Internet access conditions youth face, their level of agency when using digital technologies, their degree of experience using these technologies, their rights and responsibilities, the types of activities youth engage in, and how they do so

in creative, meaningful, ethical, responsible, and participatory ways.

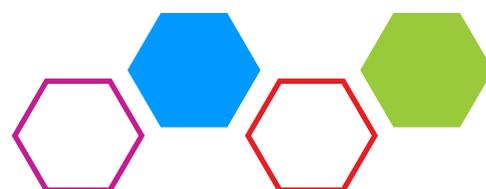
In parallel with the study of challenges and opportunities youth have been and still are encountering in the digital environment, different stakeholders — including those in government, international organizations, NGOs, and academia — have looked more closely at the skills that help youth make better use of digital technologies. Concepts such as digital citizenship, digital literacy, and new media literacies have been used to group these skills, as well as organize them under educational programs that can be implemented in formal, informal, and connected learning environments.

2. EXPLORING THE EARLY LANDSCAPE OF DIGITAL CITIZENSHIP

In our rapidly evolving digital world, the notion of what it means to be a “citizen” and a “digital citizen” have become topics of increasing importance among both academics and policymakers. Despite the growing discussion around digital citizenship in research and governance, there is little consensus as to how this concept is defined. In this part I, section 2, we aim to showcase various ways “digital citizenship” has been conceptualized, starting with early definitions of the concept. These conceptions range from those that focus on the technological facets to those that explore the opportunities digital technologies may offer in supporting new forms of citizenship (Gleason & von Gillern, 2018).

Against the backdrop of the growing use of the Internet and digital technologies in the late 20th and early 21st centuries, an initial conception of digital citizenship was put forth in 2004 by educational technology consultant Mike Ribble. Digital citizenship

was defined as “the norms of behavior with regard to technology use” (e.g., how to safeguard one’s physical health in the context of technology use (e.g., mitigating eyestrain), how to protect the integrity of one’s information and digital devices, and how to buy and/or sell goods online) (Ribble, Bailey, & Ross, 2004, p. 7). Later, in 2007, Ribble and co-author Gerald Bailey released *Digital Citizenship in Schools*, providing a set of professional development resources geared towards teachers, school staff, and administrators to help them better understand digital citizenship and how to incorporate this concept in a school or district. The book also offers lesson plans to guide teachers in implementing digital citizenship within the classroom. That same year, the International Society for Technology in Education (ISTE) — a nonprofit dedicated to educators interested in integrating technology in education — incorporated the term “digital citizenship” in the refresh of their 1998 National Educational Technology Standards



(NETS) for Students. The 2007 digital citizenship standard called upon students to “understand human, cultural, and societal issues related to technology and practice legal and ethical behavior” in the digital environment (ISTE, 2007, p. 2). This normative view of digital citizenship focuses on helping young people understand the values and norms around responsible and appropriate use of digital technologies.⁴ According to this perspective, put forth by Ribble and ISTE, educators cultivate youth’s digital citizenship by, for example, teaching young people how to understand and apply legal concepts to the content they share, manage their online security, and assess the credibility of information online.

A different early model of digital citizenship defines the concept within the context of economic and political participation in society. According to Mossberger, Tolbert, and McNeal (2007), digital citizens are those “who use the Internet regularly and effectively – that is, on a daily basis” (p. 1). “Effective” Internet use not only implies daily Internet use, but the technical competence to use digital technologies (e.g., knowing how to use computer hardware and software) and possessing the skills to find, understand, evaluate, and use information in the digital environment. In turn, regular and effective Internet use helps an individual participate in society, economically and politically. More specifically, digital citizens use the Internet “at work for economic gain” and “for political information to fulfill their civic duty” (Mossberger et al., 2007, p. 2). In this context, Mossberger and colleagues’ (2007) research, drawing upon nationally representative surveys of adults in the U.S., examined the association between their definition of effective Internet use and factors such as wages and income, civic engagement (i.e., political knowledge, interest, and online discussion), and political participation (i.e., voting). While Mossberger et al. (2007) focus their research on

the adult population, they note the importance of preparing youth to become digital citizens through 1) access to digital technologies, and 2) public school education that helps promote both the technical skills to use digital technologies and the ability to find and critically engage with information online.

Another approach to digital citizenship examines how — primarily in response to social and economic shifts⁵ largely occurring in industrialized democracies and the growing use of digital technologies — young people today are engaging with civics and politics in ways different from the notion of citizenship characteristic of previous generations (Bennett, 2008; Dalton, 2008; Kahne, Lee, & Feezell, 2012). According to this perspective, what is often viewed as a lack of civic and political engagement among youth might instead be due to a shift in the type of citizenship youth are embracing, from “dutiful” to “actualizing”⁶ (Bennett, 1998, 2007, 2008, 2012; Bennett, Wells, & Rank, 2009). In the “dutiful” model, citizenship is based on traditional concepts of citizenship that emphasize civic and political activities such as voting and staying informed about public events through traditional mass media (e.g., newspapers, television) (Bennett, 2008). The literature, in and beyond the U.S., indicates broad patterns of decline in traditional forms of civic and political engagement among young adults,⁷ including voting (Fieldhouse, Tranmer, & Russell, 2007; File, 2014) and trust in elected officials (Gramlich, 2019). By contrast, in the “actualizing” model, activities associated with traditional citizenship are not as meaningful as those that more closely align with individuals’ values and interests, such as advocating for issues like gender equality, environmental conservation, or other causes individuals are passionate about (Bennett, 1998, 2007, 2008). In this model, civic and political activities are often carried out in the context of peer-to-peer relationships and

³ The 2007 refresh of the 1998 NETS for Students marked a shift from a focus on learning how to use technology to leveraging technology to learn (ISTE, n.d.).

⁴ Ribble and ISTE have since updated their conceptions of digital citizenship. See Ribble and Park (2019) and (ISTE, n.d.); both of these updated frameworks have been mapped in our visualization (see part III, section 3). For the purposes of this part I, section 2, however, the focus is on early definitions of digital citizenship.

⁵ To learn more about such shifts in the context of civic and political participation please see, for instance, Bennett (1998), Giddens (1991), and Inglehart (1997).

⁶ As Bennett, Freelon, and Wells (2010) note, it’s important to keep in mind that certain individuals or demographic groups are not likely to engage exclusively in activities associated with “actualizing citizenship,” versus “dutiful citizenship,” or vice versa. Instead, these models are meant to showcase overall trends in civic and political engagement.

⁷ File (2014) and Fieldhouse et al. (2007) define young adults as those ages 18-24, while Gramlich (2019) as those ages 18-29.

coordinated via digital technologies⁸ (Bennett, 2007, 2008). Although Bennett does not view actualizing citizenship as originating from the growing use of digital technologies, the digital landscape represents an important space in expressing this form of citizenship (Kligler-Vilenchik, 2017).

As Bennett et al. (2010) observe, the growing prevalence of participatory practices online – often within a “participatory culture” – appears to represent one contributing factor to emerging forms of civic and political engagement among youth. According to Jenkins and colleagues (2006, p. 3), a participatory culture is a culture “with relatively low barriers to artistic expression and civic engagement,” characterized by support for sharing one’s creations with others, often in the context of informal mentorships. In the digital landscape, engagement in a participatory culture may take the form of: 1) expressions (creating content, such as fan fiction), 2) affiliations (being part of online communities, such as forums or social networking platforms), 3) collaborative problem-solving (working with others to create new knowledge, like through Wikipedia), and 4) circulations (impacting the way that media content flows by, for instance, podcasting) (Jenkins et al., 2006). For youth with access to digital technologies and the requisite skills to use them, participatory cultures thus create opportunities to connect with interest-driven communities, cooperate on peer-based production projects, and share information, among other productive activities (Benkler, 2006; Jenkins, 2006; Jenkins et al., 2006; Ito et al., 2010). These forms of engagement in the digital world can open opportunities for creativity, learning, self-expression, and civic engagement (Jenkins et al., 2006).

In the context of civic engagement, many youth today are expressing their voice around civic issues by creating and circulating media such as memes, blogs, or videos (Jenkins, Shresthova, Gamber-Thompson, Kligler-Vilenchik, & Zimmerman, 2016). As Cohen and Kahne (2012) explain, “the participatory skills, norms, and networks that develop

when social media is used to socialize with friends or to engage with those who share one’s interests can and are being transferred to the political realm” (p. 3). Building off of Jenkins et al.’s (2006) concept of participatory culture, “participatory politics” can be defined as “interactive, peer-based acts through which individuals and groups seek to exert both voice and influence on issues of public concern” (Cohen & Kahne, 2012, p. vi). These acts may take the form of, for example, using Twitter to rally individuals around a cause someone cares about or sharing political news on social media (Cohen & Kahne, 2012; Kahne, Hodgins, & Eidman-Aadahl, 2016). Recent research helps shed light on such practices among youth. On a global scale, a study of 9-to-17-year-olds across 10 countries – Albania, Argentina, Brazil, Bulgaria, Ghana, Italy, Montenegro, the Philippines, South Africa, and Uruguay – indicated that 13% were involved in an online protest or campaign, and 19% talked about social or political issues with others online (Global Kids Online, 2019). Additionally, several studies in and outside of the U.S. show that online participatory practices among youth are associated with offline political participation like voting (Cohen & Kahne, 2012) and activities such as volunteering and raising money for a charitable cause (Xenos, Vromen, & Loader, 2014).

The three conceptions of digital citizenship (Gleason & von Gillern, 2016) reviewed in this part I, section 2 represent a piece of the rich contributions to the digital citizenship landscape. Our notion of digital citizenship – what we term “digital citizenship+ (plus)” (see this part I, section 6) – draws inspiration from the wide-ranging body of literature on digital citizenship and other concepts (e.g., digital literacy, digital competence, 21st century skills, media literacy, new media literacies⁹), while integrating our extensive research and educational work on youth and digital media.

⁸ Digital technologies represent a key arena where forms of actualizing citizenship are enacted, but are not the sole arena (Bennett et al., 2009). Offline examples of actualizing citizenship might include, for instance, boycotting specific products for environmental reasons or signing a petition around veterans’ issues (Shehata, Ekström, & Olsson, 2016).

⁹ See part II for a high-level overview of these concepts.

3. DIGITAL CITIZENSHIP IN THE CLASSROOM



This part I, section 3 discusses how digital citizenship has been incorporated in the classroom over the past decade or so. However, it's important to note that, in parallel, schools around the world may also have been teaching digital skills, but incorporating these skills under a different concept (e.g., digital literacy, media literacy).

In the mid to late 2000s, as the Internet and digital technologies started to become more common, the primary focus in education in the context of the digital environment (beyond technical skills such as learning to type and using certain software) centered around Internet safety. These efforts arose in response to public concern around the possible risks youth encounter online, particularly around cyberbullying, Internet addiction, and online predators (Jones, 2010; Palfrey & Gasser, 2008). During that time, schools in the U.S., for example, increasingly incorporated some form of Internet safety education (ISE) into the curricula – a survey of youth Internet users in 2010 revealed that nearly half (45%) indicate receiving ISE in school, an increase of 15% from 2005 (Mitchell, Jones, Finkelhor, & Wolak, 2013).

Starting around the early to mid 2010s, in many regions of the world, however, policymakers' understanding of the role digital technologies play in education shifted from a focus on online protection towards a more balanced approach that helps support youth participate online in critical, effective, and responsible ways (United Nations Educational, Scientific and Cultural Organization [UNESCO], 2016). For instance, in the U.K., policymakers observed that the potential risks stemming from online content can be managed if policies address not only safety and basic digital literacy skills but also the skills needed to ethically and critically use digital technologies (Byron, 2008). As UNESCO (2016) points out, in Europe, such a shift is evidenced in the conversion of the Safer Internet Programme into the Better Internet for Kids Programme (European Commission, 2012). In the U.S., we see a move towards more balanced policies

through, for instance, Washington state's bill around incorporating digital citizenship, Internet safety, and media literacy in the school curriculum,¹⁰ which has acted as a model bill for other states in the U.S. (Media Literacy Now, 2016). Moving beyond a sole focus on the risks the digital environment may present, the state's Digital Citizenship Advisory Committee (Small, 2016) explains:

Students must understand how to use personal technology in ways that augment their learning experience, leading to analysis, evaluation, reflection, and enhanced skills of expression. Our students can be expected to continue actively engaging and expressing their voices in this digital landscape; we must therefore endeavor to provide the education that will empower them to become media literate and digitally responsible global citizens. (p. 4)

What does digital citizenship education look like in the classroom today? While there is currently little research addressing how digital citizenship is incorporated in schools, preliminary data in and outside of the U.S. helps shed light on this important topic.

In the U.S., Common Sense's recent nationally representative survey of 1,208 kindergarten through 12th grade¹¹ teachers found that approximately 60% of teachers nationwide utilize a digital citizenship resource or curriculum with their students. In the survey, digital citizenship was defined as "thinking critically, behaving safely, and participating responsibly in the digital world" (Vega & Robb, 2019, p. 7). The survey revealed that almost half (48%) of high school teachers used some form of digital citizenship curricula or resource, versus 57% of middle school teachers. Across all grade levels, among those teachers who used a digital citizenship resource or curriculum, a large majority (91%) indicated that it was at least "moderately" effective in "helping students make smart, safe, or ethical decisions online" (Vega & Robb, 2019, p. 11). The

¹⁰ To learn more about Washington state's digital citizenship, Internet safety, and media literacy legislation, please see this part I, section 5.

¹¹ N.B: To view kindergarten through 12th grade corresponding ages based on the U.S. educational system please see Appendix D, "Table 2. K-12 Grades And Approximate Corresponding Ages In U.S. Education," from Gasser et al. (2012).

survey also assessed whether teachers taught any of the following six digital citizenship competencies, as defined by Common Sense: 1) “privacy and safety,” 2) “digital footprint and identity,” 3) “relationships and communication,” 4) “media balance and well-being,” 5) “news and media literacy,” and 6) “digital drama, cyberbullying, and hate speech”¹² (Vega & Robb, 2019, p. 9). Overall, a majority of secondary school teachers (76%) taught at least one competency.

Across all grade levels, among those teachers who incorporate digital citizenship competencies in the classroom, which competencies do they teach most often? “Digital drama, cyberbullying, and hate speech” represented the most frequently taught competency (46%), followed closely by “privacy and safety” (43%). For teachers who taught any of the six competencies, the survey revealed that about 60% did so on a monthly basis, or more frequently. And though “relationships and communication” and “news and media literacy” represented the third and fourth most commonly taught competencies (both taught by 38% of teachers), they were incorporated in the classroom more frequently by those who taught them. Approximately seven out of 10 who taught “relationships and communication” and/or “news and media literacy” did so at least monthly. In contrast, about six out of ten teachers who taught “digital drama, cyberbullying, and hate speech” and/or “privacy and safety” did so at least monthly. Vega and Robb (2019) note that this finding indicates that “relationships and communication” and “news and media literacy” may represent areas that students find particularly engaging.

What does digital citizenship education look like in classrooms in other parts of the world? In the Asia-Pacific region, UNESCO (2016) undertook a review of Member States’ national digital citizenship policies for pre-primary, primary, and secondary schools as part of their “Fostering Digital Citizenship through Safe, Effective and Responsible Use of ICT¹³” project.

Digital citizenship was defined as

being able to find, access, use and create information effectively; engage with other users and with content in an active, critical, sensitive and ethical manner; and navigate the online and ICT environment safely and responsibly, while being aware of one’s own rights (UNESCO, 2016, p. 15).

The survey revealed that, among the 22 Member States that participated,¹⁴ a vast majority (80%) have national programs, policies, and resources for secondary schools that aim to cultivate basic skills related to digital technologies. Fewer Member States (55%), however, have implemented policies for secondary schools geared towards promoting skills around more participatory and creative ways of engaging with the digital world, such as creating, collaborating, and communicating with others online. And only about half of Member States have implemented policies around promoting the responsible and safe use of digital technologies. The review also examined the extent to which Member States’ policies are balanced in terms of promoting opportunities while reducing risks that may come with digital technologies. The report defined “opportunity-oriented policies” as policies that “promote ICT access and use, and the creation of ICT-enabled outputs” (UNESCO, 2016, p. 41). Specific aspects of online opportunities that the survey focused on included coding, creating and collaborating with others, and producing videos and images online. “Risk-oriented policies” were those that “seek to ensure students have the necessary skills to protect their privacy and . . . ensure cyber security” (p. 41). For secondary school students, results indicated that most Member States place a greater emphasis on policies addressing opportunities, versus risks. This finding was particularly evident in countries such as Japan, China, Niue, Uzbekistan, and the Cook Islands. By contrast, Afghanistan, Samoa, and Australia tended to have more safety-focused policies. Despite this varied policy landscape, the survey demonstrated that Member States’ policy readiness to encourage

¹² To view the definitions of these six competencies, please see page nine of Vega and Robb (2019).

¹³ “ICT” is an acronym for “information and communications technology.”

¹⁴ To view the list of participating Member States, please see page 71 of UNESCO (2016).



youth to harness digital opportunities had a strong, positive association with their readiness to mitigate online risks (UNESCO, 2016). This finding, which held across all grade levels, suggests that, on the whole, Member States tend to have policies that balance the opportunities and risks associated with the digital world. Based on overall findings from the review, the report put forth several policy recommendations, such as developing policies that increase opportunities for youth to engage with digital technologies in creative and participatory ways. The report also recommends that Member States design policies tailored to their local context, and aligned with the experiences and needs of students in these contexts.

Other stakeholders around the world have also put forth recommendations and guidelines with respect to digital citizenship education. In Europe, for example, the Council of Europe's Committee of Ministers recently adopted a set of guidelines for its 47 member States that encourage States to design and support digital citizenship education, and policymakers to prioritize it (Council of Europe, 2019b). The guidelines

are part of the Council's intergovernmental project, "Digital Citizenship Education," launched in 2016 (Council of Europe, n.d.). According to the Council of Europe, "digital citizenship" is defined as "the capacity to participate actively, continuously and responsibly in communities (local, national, global, online and offline) at all levels (political, economic, social, cultural and intercultural)" (Council of Europe, 2019a, para. 4). The Committee of Ministers' guidelines around approaches to teaching digital citizenship – within both formal and informal learning settings – emphasize the importance of helping learners understand how to use digital technologies to participate in democratic activities, and take part in offline activities that promote democratic citizenship, such as engaging in intercultural dialogue (Council of Europe, 2019a). Additionally, the guidelines recommend the development of learning opportunities that are co-designed with learners themselves, creating pathways for individualized and inclusive learning.



4. SOME COMPLICATING ELEMENTS

"Digital citizenship" as a term and concept – acknowledging that different notions exist – continues to be debated. Even within our YaM team, we appreciate the different notions but also have questions and concerns around the term "digital citizenship" – primarily in the context of youth. There are two complicating elements from our point of view:

1. Digital. First, our own research indicates that – with increased access and potentially more agency and experience related to digital technologies, particularly mobile phones – for many youth, the online and offline worlds are becoming so connected that they are often perceived as just one world. So why not use the term "citizenship" instead of "digital citizenship"? Is the "digital" supposed to highlight the relevance of the online ecosystem? Or is it meant to emphasize the digital tools that are available to

exercise one's rights and responsibilities? And if we continue to use the term "digital citizenship," do we then diminish (at least in perception) the fact that the most crucial forms of participation are those in which online activities are translated to offline engagement, and thus fail to address these challenges appropriately?

2. Citizenship. Second, do we, as decision-makers, believe that youth are able to identify as "citizens" and "digital citizens"? This adult-normative perspective of citizenship has been introduced to young people with little explicit youth consultation (Clark & Marchi, 2017). More specifically, the discourse around youth and citizenship has been shaped by several factors, such as the perception that 1) youth need protection from potential harm in public spaces (e.g., from predatory adults), and that 2) youth themselves are a source of harm, and adults are in need of protection from

them (even when such youth are not dangerous) (Clark & Marchi, 2017). As a whole, such a view on youth and citizenship suggests that adults should teach youth how to exercise the rights and responsibilities associated with traditional citizenship, such as political participation (Sherrod, Flanagan, & Youniss, 2002). According to this perspective, young people “must be socialized into adult norms of political involvement rather than being thinking agents who may express important critiques of citizenship” (Clark & Marchi, 2017, p. 25). Additionally, this approach presumes that there is the promise of basic rights and an expansion of rights (and responsibilities) for youth in the future. As Clark and Marchi (2017) point out, however, “Unfortunately, this does not pertain to many young people who have experienced marginalization due to disability, race, sexual orientation, lack of access to resources, or their parents’ citizenship status” (p. 25).

While we continue to reflect upon these concerns, we also recognize the value of using and more heavily adopting the term “digital citizenship.” One, by adding “digital,” we believe the concept more strongly showcases the role and agency youth have in fostering their empowerment and visibility. Two, “digital” in combination with “citizenship” makes it more plausible that youth will engage with this concept, even if they are not of the legal voting age, as it appears to be a more flexible and open notion than other forms of citizenship. Three, compared to other concepts, such as digital literacy and new media literacies, digital citizenship generally appears to be more holistic, and thus, in our opinion, a more helpful notion to refer to when debating important areas of life related to the digital landscape, as well as the corresponding skills needed to be successful within those areas.

5. BOUND TO THE TERM “DIGITAL CITIZENSHIP”



Independent of the extent to which one prefers the concept of digital citizenship over other concepts, we have chosen to use digital citizenship as a large number of governments, international organizations, NGOs, and academics have adopted it to design, develop, and shape formal and informal learning spaces and programs for youth around areas of life connected to the digital world.

For example, several governmental organizations have started to create their own digital citizenship frameworks around young people’s interactions with digital media (often later developing accompanying educational programs and learning materials). Within the frameworks, these stakeholders have put forth a set of skills they believe are important in navigating the digital world. Three examples of such frameworks include:

- Chile’s Ministry of Education (MoE): In 2016, Chile’s MoE launched a digital citizenship program under the Internet Segura (“Secure Internet”) campaign. Internet Segura is a part of MoE’s broader Enlaces (“Links”) program, a national public policy that seeks to provide educational resources and digital infrastructure to public schools in Chile (Blignaut, Hinostroza, Els, & Brun, 2010). The initiative’s digital citizenship framework emphasizes the protection of young people online, addressing concerns around protecting one’s privacy and security, and online bullying. Enlaces is developing a “Digital Citizenship Network” of public, private, and civil society stakeholders that seeks to shape public policy by training educators across Chile in teaching digital citizenship (Enlaces, 2017). Additionally, the MoE has released a set of digital citizenship educational resources for children and youth from pre-elementary to secondary school (Enlaces, 2018).
- Washington state Legislature: In 2016, Washington state passed legislation (Substitute Senate Bill 6273) creating a support structure

for kindergarten through 12th grade teachers to incorporate digital citizenship, media literacy, and Internet safety education in public schools across the state (Media Literacy Now, 2020a). The bill stipulated that the Office of Superintendent of Public Instruction bring together an advisory group to develop recommendations and best practices around digital citizenship, media literacy, and Internet safety instruction (Media Literacy Now, 2020b). In 2017, Washington state implemented several of these recommendations, such as surveying school principals, librarians, and technology directors to better understand how they are incorporating these three concepts in the curriculum, and creating an online repository of recommended educational resources (Washington Office of Superintendent of Public Instruction, n.d.). More recently, in 2019, the legislature approved funding for teacher professional development around these three areas of instruction (Media Literacy Now, 2020b).

- New South Wales' (Australia) Department of Education: Since 2011, public schools across New South Wales (NSW) have integrated digital

citizenship in classrooms for kindergarten through 10th grade students (Wittman, 2019). In 2019, NSW's Department of Education, in collaboration with researchers, updated their suite of digital citizenship educational tools, developing an online platform with resources for youth, parents, and educators (Wittman, 2019). On the platform, teachers will find an array of educational activities and games they can integrate into the classroom around topics ranging from access to digital technologies to coding, as well as professional development opportunities. Additionally, the platform showcases how the resources are connected to existing school curricula in New South Wales and Australia (New South Wales Department of Education, n.d.).

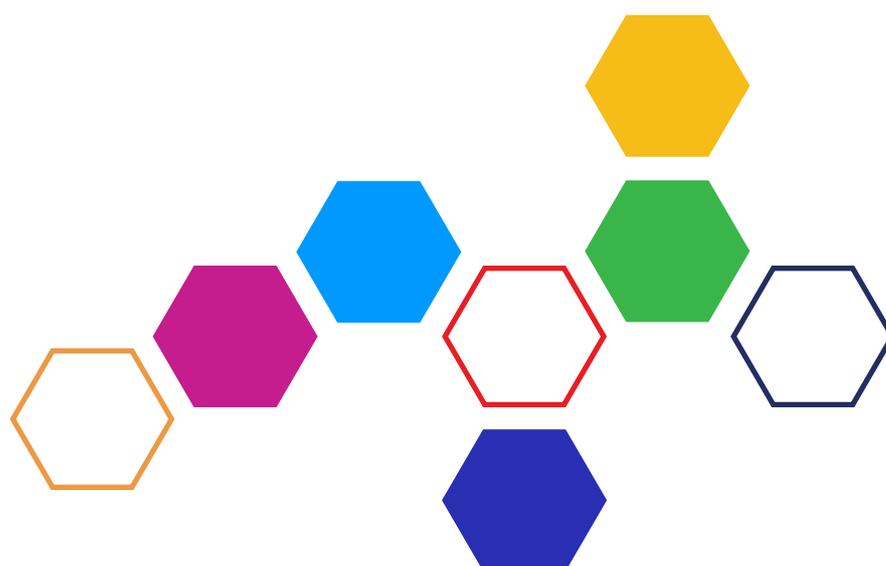
Outside of the governmental space, international organizations, NGOs, and those in academia have also developed frameworks around this concept, such as New Zealand's Netsafe (2018) model of digital citizenship; Lisa Jones' and Kimberly Mitchell's (2016) definition of digital citizenship; and DQ Institute's (2019) Digital Intelligence framework.

6. WHY “DIGITAL CITIZENSHIP+ (PLUS)”

As this part I, sections 4 and 5 demonstrate, we acknowledge the pros and cons, as well as some of our own difficulties, in using the term “digital citizenship.” However, we also recognize the wide adoption of the term among different stakeholders, as well as the different examples of digital citizenship currently being implemented in praxis (see this part I, section 5). Against this backdrop, we have chosen to use the term “digital citizenship+ (plus)” – a modified version of digital citizenship – to signal several key points:

1. The term “digital citizenship+ (plus)” broadens the conversation and questions the scope of the term. We feel that adding a “+ (plus)” encourages further reflection on why the “+ (plus)” is there, what it refers to, and why it is needed in discussions around young people navigating the digital world. This reflection is valuable because it reveals what is still left to be questioned around this widely adopted term.

2. The term might bring different communities to the same table. There are a variety of terms used to describe the skills individuals need to use technologies in our digital age, including the ones described in part II. Different stakeholders (e.g., government, international organizations, NGOs, academia) use these terms, and their work has tradition and history. Not surprisingly, these different communities can feel strongly about their chosen term(s), and as such, conversations around various terms can often become somewhat siloed. Against this backdrop, we feel that it would be worthwhile to bring different communities together to share their knowledge, ideas, and struggles. A new term might help accomplish this.
3. It keeps the term universal but flexible. Maintaining the term “digital citizenship” may garner additional support across the different communities and cultures that have adopted this term, while the addition of the “+ (plus)” could inspire communities to add skill areas they deem necessary to their own frameworks. Independent of the term that is used, we hope future communities can review our recommendations around the skill areas we present in our own framework and reflect upon the commonalities in our shared mission to promote youth skill development in the context of the digital environment.
4. It is more encompassing of different social, cultural, and regional contexts (see part IV, section 3). Although a shared conceptual understanding and standardized set of skills may facilitate the creation and implementation of educational interventions, it is important to acknowledge that the perceived importance of certain areas of life is likely based on one’s context. Having a more open term where skills can be added or prioritized differently based on one’s context may acknowledge a shared understanding that youth need to master a variety of important skills while still allowing different communities to select an approach – and group of skills – most appropriate for them. For instance, a community in which youth might not yet have the needed skills to access the Internet will need very different digital citizenship educational interventions compared to a community that wishes to prioritize young people’s ability to become entrepreneurs and gain different forms of social, cultural, and economic capital.



II. OTHER CONCEPTS



This part II provides a high-level overview of several concepts connected to digital citizenship that address youth skill development in the context of digital technologies. Like digital citizenship, each of these concepts — digital literacy, media literacy, new media literacies, 21st century skills, and digital competence — aims, at its core, to prepare individuals with the skills needed to navigate the challenges and embrace the opportunities of our evolving digital world. We hope this overview helps situate digital citizenship within a larger ecosystem of similar concepts. While by no means comprehensive, the overview is intended to illustrate relevant literature surrounding each concept — starting with a brief description of the emergence of the concept and then describing related bodies of work.

This part II demonstrates there are similarities and differences both within and across the concepts. For example, within a single concept, differences emerge around the way authors conceptually frame it and the skills they believe it should encompass. Keeping these distinctions in mind, looking across concepts, there is an overlap in the skills included within the frameworks attached to each concept. Thus, what we would like to see as distinct concepts that are neatly operationalized instead becomes concepts with moments of intersection but differences in origin and focus.



1. DIGITAL LITERACY

The American Library Association defines digital literacy as an individual's "ability to use information and communication technologies to find, evaluate, create, and communicate information using both cognitive and technical skills" (2013, p. 2). The emergence of the notion of digital literacy goes back to the debut of the World Wide Web in 1991. Very early conceptualizations of digital literacy in the 1980s (often now referred to as computer literacy) focused primarily on technical skills typically related to using computers and their software as part of career readiness (Bawden, 2008; Martin, 2005). In

1997, Paul Gilster's *Digital Literacy* suggested this initial scope should be broadened to include an individual's ability to understand and use information from a variety of networked computer sources — in particular, the Internet. The work describes digital literacy generally. Rather than listing specific skills, attitudes, or behaviors, Gilster (1997) emphasized "mastering ideas, not keystrokes" (p. 15) — ideas that capture the importance of knowledge assembly from diverse sources both digital and non-digital and critically differentiating credible online information from misinformation and disinformation.

From an entirely skill-based perspective, Eshet-Alkalai (2004) conceives of digital literacy as the survival skills needed for functioning in a burgeoning digital world. The scholar notes that digital literacy involves more than the ability to use software or operate digital devices but includes an array of complex cognitive, motor, social, and emotional skills. This skill-based model is made up of several types of literacies, including photo-visual literacy, reproduction literacy, branching literacy, information literacy, and socio-emotional literacy (Eshet-Alkalai, 2004). Later, due to the rapid development of multimedia environments and digital gaming, “real-time thinking” was added as a sixth literacy/skill (Eshet, 2012). In a different conceptualization of digital literacy, Martin (2005) defines the concept as the convergence of multiple literacies, including aspects of media literacy, visual literacy, information literacy, and ICT literacy. Refining this model, Martin and Grudziecki (2006) offer three levels of digital literacy: 1) digital competence (e.g., knowledge, skills, and attitudes), 2) the use of digital technologies as applied to specific domains (e.g., one’s field of work), and 3) the ability to use digital technologies to promote innovation and creativity. Throughout the framework, the focus is on the importance of situational embedding – that is, using digital technologies according to one’s specific context.

Martin and Grudziecki’s (2006) three levels of digital literacy may be illustrated, respectively, through the following paradigms: 1) web-focused digital literacy (e.g., Mozilla’s (2016) web literacy model); 2) digital literacy that explores how teachers and/or students engage with digital technologies in specific social contexts (e.g., Bhatt, Roock, and Adams’ (2015) work on capturing and analyzing data that examines engagement with digital texts in the classroom); and 3) curation practices related to digital literacy (e.g., Mihailidis, 2015). Per the third paradigm, for example, in the context of digital literacy, Mihailidis¹⁵ (2015) focuses on digital curation and how curation practices may help cultivate digital literacy skills

that are creative and user-driven. As one example, Mihailidis (2015) conducted a content analysis of college-aged students’ curated stories on Storify¹⁶ and how their curation practices might impact the development of digital literacy skills. He assessed digital literacy in terms of participants’ ability to bring together platforms, content, ideas, and various sources in a clear and balanced manner on the subject at hand (i.e., income inequality) through their digital stories. Results revealed that students were, overall, proficient in assembling and repurposing content while keeping a cohesive and balanced narrative. Data demonstrated variability in the clarity of the stories, which, as Mihailidis notes, may, in part, be due to students’ limited formal learning around curation. Indeed, a survey by the New Media Consortium on the landscape of digital literacy in higher education across the U.S. found that the notion of students as digital creators has not yet permeated the classroom (Alexander, Adams Becker, & Cummins, 2016). More broadly, Mihailidis’ (2015) results suggest that digital curation may be an important component of the development of digital literacy. As he explains, the study “supports the need to mobilize the voice and agency of young people through pedagogies that place them as more centered, active, and publicly situated in the process of learning and expression” (Mihailidis, 2015, p. 454).

In another conceptualization, Hargittai views digital literacy as an individual’s ability to efficiently and effectively find information online. To assess this form of digital literacy – what Hargittai terms “web-oriented digital literacy” – the scholar conducted studies where participants were tasked with finding various types of information online (e.g., Hargittai, 2002, 2005, 2009). These observations of individuals’ online browsing behavior focused on the percentage of tasks completed, or “effectiveness,” and the amount of time participants spent on the tasks, or “efficiency” (Hargittai, 2005). Additionally, participants were given an assessment of their knowledge around certain Internet- and computer-related terms (e.g.,

¹⁵ In addition to digital curation, Mihailidis also explores citizenship practices in the context of media literacy. He proposes several “civic media literacies” that aim to “reframe media literacy interventions towards civic intentionality: a set of design considerations for media literacy initiatives that are based on the value systems of agency, caring, persistence, critical consciousness, and emancipation” (2018, p. 153). To learn more about Mihailidis’ work around civics and media literacy, please also see, for example, Gordon and Mihailidis (2016), Mihailidis (2014, 2018, 2019), and Mihailidis and Gerodimos (2016).

¹⁶ Storify is an online platform that allows users to create stories by drawing content from social media platforms (e.g., Twitter, Facebook) and adding text to complement the story (Mihailidis, 2015).

"cookie," "download," "message thread"). Hargittai (2005) found participants' knowledge of such terms served as a proxy of their web-oriented digital literacy. She observed that this assessment of individuals' knowledge of Internet-related terms correlates more with web-oriented digital literacy than traditional digital skill proxies (e.g., Internet self-efficacy, amount of time spent online) (Hargittai, 2005). In a review of knowledge around such terms over time, Hargittai and Hsieh (2012) explain that while some terms are relatively consistent (e.g., browser-related terms such as "bookmark," "favorites," and "reload"), other terms, such as "tagging" and "Wiki," are associated with increased understanding over the years. Hargittai notes that this trend likely reflects the increasing popularity of Wikipedia, activities related to the use of social media platforms, and the evolving nature of digital technologies.

A variation of Hargittai's web-oriented digital literacy can be seen in van Deursen's (2010) framework around digital skills¹⁷ – more specifically around his definition of operational skills and formal skills. According to van Deursen, digital skills comprise four skill sets: 1) operational skills, which include the technical skills needed to operate computers and the Internet (e.g., knowing how to bookmark a website or download a file); 2) formal skills such as browsing and navigating the Internet (e.g., knowing where to click to go to a different page on the Internet); 3) informational skills, including searching, selecting, and evaluating information online (e.g., knowing the best keywords to use in an online search); and 4) strategic skills, using technologies to achieve one's goals (e.g., comparing prices of products sold online). In his later work, van Deursen added 5) content creation skills needed to create and disseminate content in the digital landscape (e.g., uploading and sharing music and video content), and 6) communication skills to reflect the skills necessary to work with others online (e.g., constructing profiles and identities on social media) (van Deursen, Helsper, & Eynon, 2014; van Dijk & van Deursen, 2014).

In *Defining Digital Literacy: What Young People Need to Know About Digital Media*, David Buckingham (2006) addresses the intersection of digital literacy and media literacy in the context of youth. From the perspective of media literacy education, Buckingham (2003, 2006) positions digital literacy across four facets of media education: 1) representation (understanding how reality is represented in media by, for instance, questioning implicit values and/or biases of online content); 2) language (recognizing how meanings are constructed in the "language" of media by, for example, critically navigating online sites with hyperlinks, graphics, and/or videos); 3) production (comprehending how media are produced by, for instance, asking what technologies are used to generate and distribute material online); and 4) audiences (understanding how media target audiences by being aware of, for example, how social media platforms collect users' information). This notion of digital literacy emphasizes the importance of developing critical approaches to digital media, along with an understanding of digital media's social, economic, and cultural implications.

The role of digital media creation by students as an important part of digital literacy is also addressed by Renee Hobbs. Hobbs (2010) conceptualizes digital and media literacy as the set of emotional, social, and cognitive abilities associated with analyzing, accessing, creating, reflecting, and acting upon media messages in various forms. Against this backdrop, in *Create to Learn*, Hobbs (2017) helps learners apply this constellation of abilities as they develop multimedia content (e.g., videos, animations, infographics) and cultivate communication and critical thinking skills. Her work has also examined the underlying attitudes that contribute to teachers' interest in integrating digital literacy into the elementary and secondary school curriculum and the pedagogies and instructional practices that support the development of teachers as they learn digital literacy skills (Hobbs & Coiro, 2019; Hobbs & Tuzel, 2017).

¹⁷ van Deursen, and his collaborator van Dijk, prefer the word "skills" over literacies, as they believe it "suggests a more inter(active) performance in media use than, for example, 'literacy,' which refers to reading and writing text" (van Dijk & van Deursen, 2014, p. 4). For instance, Internet use extends beyond reading text on a website to interacting with others online, through social media, email, or gaming communities (van Dijk & van Deursen, 2014).

2. MEDIA LITERACY AND NEW MEDIA LITERACIES

Expanding from a tradition that developed during the 20th century, media and new media literacy frameworks have continued to evolve in the 21st century in response to the rapid pace of media technology innovation and the transformation of the communication environment. Academics, policymakers, educators, and activists, mainly from Europe, Australia, and the U.S., have developed these frameworks in an attempt to address questions about media access, production, interpretation, and distribution, and their relationship to participation in society, culture, and the economy (Buckingham, 2007; Bulger & Davison, 2018; De Abreu, Mihailidis, Lee, Melki, & McDougall, 2017; Hobbs, 2010; Hobbs & Jensen, 2009; Livingstone, 2003; Tyner, 1998). Although both media and new media literacies have common roots and share similar aims and purposes, the main difference is that media literacy focuses on personal and individual engagement with mass media, popular culture, and digital media while new media literacies also acknowledge community involvement and participatory culture¹⁸ as part of skill development (Jenkins et al., 2006).

During the 1990s and early 2000s, stakeholders arrived at a comprehensive definition of media literacy that included skills at multiple levels of media engagement: access, analysis, evaluation, and content creation (Buckingham, 2003; Gee, 2010; Masterman, 1993). Balancing protectionism and participation, and identifying a range of media literacy skills, broad media literacy frameworks have been consolidated in official documents by national and international policymakers, including the U.S. National Leadership Conference of Media Literacy (Aufderheide, 1993), Ofcom (2004), the European Commission¹⁹ (2007), and UNESCO (Grizzle et al., 2013). Likewise, scholars have developed conceptual frameworks, researched media literacy skills, and investigated media literacy teaching practices and effectiveness. While some theorized about media literacy education and its implementation in formal and informal learning settings (Bazalgette, 2008;

Buckingham, 2003, 2007; Hobbs & Jensen, 2009; Livingstone, Van Couvering, & Thumim, 2008; Tyner, 1998), others investigated and identified different kinds of media literacy skills (Adams & Hamm, 2001; Brown, 1998; Hobbs & Frost, 2003; Livingstone, 2008; Pérez Tornero & Varis, 2010). Still others focused their research on the practical aspects of teaching media literacy and evaluating its effectiveness (Alvermann, Moon, & Hagood, 1999; Duran, Yousman, Walsh, & Longshore, 2008; Hart, 1997).

At the start of the 21st century, the notion of “new media literacies” emerged as part of the development of the interdisciplinary field of New Literacy Studies (NLS). Led by Jean Paul Gee, the New Literacy Studies initiative brought together leading scientists, historians, sociologists, and communication and media scholars to understand literacy as a sociocultural phenomenon. By recognizing literacy as a discourse, and acknowledging situated cognition, or the importance of one’s experiences in the context of learning, NLS scholars validated the possibility of mastering a broad range of discourses or literacies (Gee, 2010). NLS had a direct impact on the aims and purposes of media literacy as it opened a space for the recognition of multiple new literacies across a rich variety of social and cultural mediated practices. The notion of “new media literacies,” developed by Henry Jenkins and his team in the white paper *Confronting the Challenges of Participatory Culture* (Jenkins et al., 2006), emerged in the context of recognizing multiple literacies and NLS. After studying the emerging sociocultural practices that youth, mainly in the U.S., develop as they interact with digital media tools, networks, and communities, Jenkins et al. (2006) identified eleven “new media literacy” skills, including play, appropriation, collective intelligence, transmedia navigation, networking, and negotiation. These skills are meant to build on the foundation of traditional literacy (i.e., reading and writing) as well as research and critical analysis skills.

¹⁸ Please see part I, section 2 to learn more about participatory culture (Jenkins et al., 2006).

¹⁹ For a helpful review of the history of European Union policy around media and digital literacy, please see Pérez Tornero and Pi (2013).

3. 21ST CENTURY SKILLS

Technological advancement, globalization, and demographic shifts around the turn of the 21st century started to shape the way stakeholders — including policymakers, NGOs, international organizations, the private sector, and academics — have conceptualized the skills needed to thrive in today's society and the workforce. As Chu, Reynolds, Tavares, Notari, and Lee (2017) point out, in 1996, UNESCO's Delors Report, developed by the organization's International Commission on Education for the Twenty-first Century, helped to initiate the conversation around the notion of 21st century skills. The report emphasized the importance of lifelong education in the 21st century, recommending that education be developed along four pillars: learning to do, learning to know, learning to be, and learning to live together. When Jacques Delors, who chaired the commission, was asked what the key message was for education in the future, he noted, "make human beings more aware of themselves and of what is around them" (Delors, 1994, p. 348) — highlighting both "learning to be" and "learning to live together" (Elfert, 2015).²⁰

In response to the Delors Report, government, international organizations, academics, and the private sector developed frameworks to both describe the skills youth need to succeed in today's information society and offer learning objectives for the 21st century skills valued in school, the workplace, and the broader community (Chu et al., 2017; Kay, 2010). Several include the World Economic Forum's framework of 21st century skills (2015); the National Research Council's (2012) model of 21st century skills; the Partnership for 21st Century Learning's (P21) Framework for 21st Century Learning (2019); the Organisation for Economic Co-operation and Development's (OECD) three-dimensional framework of 21st century skills (Ananiadou & Claro, 2009); and the Assessment and Teaching of Twenty-first Century Skills' model (Griffin, McGaw, & Care, 2012). Chu and colleagues (2017) examined the latter three

frameworks and grouped common skills under three areas: 1) learning and innovation (e.g., critical thinking, collaboration, creativity); 2) information, media, and technology skills (e.g., media literacy, information, and communication technology skills); and 3) life and career skills (e.g., adaptability, cross-cultural competency).²¹ Thus, while conceptual models vary in terms of specific skills included, Chu et al.'s (2017) definition offers a helpful way of understanding the core ideas across existing 21st century skills frameworks.

In another review of 21st century skill frameworks, Dede (2010) compared frameworks from stakeholders such as the Metiri Group and the North Central Regional Educational Laboratory (Lemke, 2003) and the Association of American Colleges & Universities (2007) (in addition to P21 and OECD) to highlight consistencies across the skills included in the frameworks. Dede acknowledges, however, that stakeholders vary in terms of what skills or sub-skills they consider to be especially important (e.g., "acting autonomously" or "risk taking") (Dede, 2010). Regardless of the particular emphasis a framework may have, Dede explains how technological development and globalization are changing the nature of perennial skills (i.e., skills that have been important throughout historical changes in the workforce) and creating new contextual skills (i.e., skills that are uniquely relevant to the workplace and society more broadly in the 21st century) (Dede, 2010). For instance, collaboration is a capability that has been perennially critical in workplaces throughout history. In the context of the 21st century, collaboration has become even more important as individuals increasingly engage in information-based economies and use digital tools to connect with others. As Silva (2009, p. 631) notes, the skills within 21st century skills frameworks are "not new, just newly important" in the context of a changing global economy.

²⁰ Nearly two decades after the publication of the report, UNESCO explored how the four pillars are applied in schools today in nine countries/jurisdictions in the Asia-Pacific region (Care & Luo, 2016). UNESCO now terms these four pillars "transversal competencies," defined as the "knowledge, skills, values, and attitudes that are integral to life in the 21st century" (2016, p. 1). The report revealed that while these competencies are on the educational agenda of the countries/jurisdictions studied, there were several key barriers to assessment, including 1) defining what exactly constitutes "skills" and "competencies" and deciding which are valuable to assess; 2) equipping teachers with the tools to understand how skills develop over time and how to adjust pedagogical strategies accordingly; and 3) the tension between 21st century skills and a specific country's views about what the educational system should emphasize.

²¹ For a detailed account of each of these areas, please refer to Chu et al. (2017).

4. DIGITAL COMPETENCE

Much like the emergence of 21st century skills, against the backdrop of increasing globalization, demographic changes, and digital technology development around the start of the 21st century, in 1997, the OECD introduced the Programme for International Student Assessment (PISA) (Ananiadou & Claro, 2009). The assessment aimed to measure the degree to which students nearing the completion of their compulsory schooling (at the age of 15) have gained skills and knowledge around areas such as mathematics, reading, science, and increasingly important domains, such as lifelong learning. For instance, the assessment asked students about specific learning strategies they use, their motivation to learn, and their confidence in their ability to learn (OECD, 2005). The same year, the OECD launched the DeSeCo²² program to help guide the identification of competencies²³ for *all* youth and adults, and further refine international assessments of competence levels within these populations (OECD, 2005). The DeSeCo program, framed around the importance of lifelong learning, categorized these competencies along three broad domains: 1) the ability to use an array of tools (ranging from the physical, such as digital technologies, to the sociocultural, such as language) to interact with one's environment; 2) the ability to take responsibility for one's life and act autonomously; and 3) the ability to work effectively with others in diverse groups (OECD, 2005).

Shortly after the launch of the DeSeCo program, in 2005, the European Commission called upon Member States to modify their educational systems to help equip youth with the competences needed for lifelong learning (von Hebel, 2009). In 2006, the Recommendation of the European Parliament and the Council of the European Union (2006) on Key Competences for Lifelong Learning aimed to offer a common European framework for such competences, geared towards stakeholders such as educators and policymakers. The Recommendation proposed eight key competences – among them, digital competence.

Digital competence was defined as “the confident and critical use of Information Society Technology (IST) for work, leisure and communication” (2006, p. 13). To more fully explore the skills, knowledge, and attitudes associated with digital competence, in 2011, the European Commission's Joint Research Centre began to develop a framework around the concept titled the Digital Competence Framework for Citizens (DigComp). Now in its third iteration, DigComp 2.1, the framework defines digital competence along five key domains: 1) information and data literacy, 2) communication and collaboration, 3) digital content creation, 4) safety, and 5) problem solving (Carretero, Vuorikari, & Punie, 2017). Across these five domains are in total 21 competences, with eight levels of proficiency for each. DigComp 2.1 is being implemented in over 20 countries in and outside of Europe in various ways, such as the development of formal and informal learning programs to cultivate digital competences, policymaking for digital education, and digital competency assessments²⁴ (Kluzer & Pujol Priego, 2018).

The European Commission's DigComp is meant for a broad audience of both youth and adults (Kluzer & Pujol Priego, 2018). Some frameworks around digital competence, however, while applicable to a general audience, were specifically developed in the context of a target group of individuals. For instance, Calvani, Cartelli, Fini, and Ranieri (2008) proposed a definition centered around three dimensions of digital competence (technological, ethical, and cognitive) that they assessed in a sample of secondary school students (Calvani, Fini, Ranieri, & Picci, 2012). The authors developed their definition and assessment of digital competence to shed light on young people's digital skills – technical knowledge as well as higher-order cognitive skills, and sociocultural knowledge around digital technology usage²⁵ – and inform school-based educational interventions.

Krumsvik (2008) also situated his conceptualization of digital competence within the educational

²² “DeSeCo” stands for “Definition and Selection of Competences: Theoretical and Conceptual Foundations.”

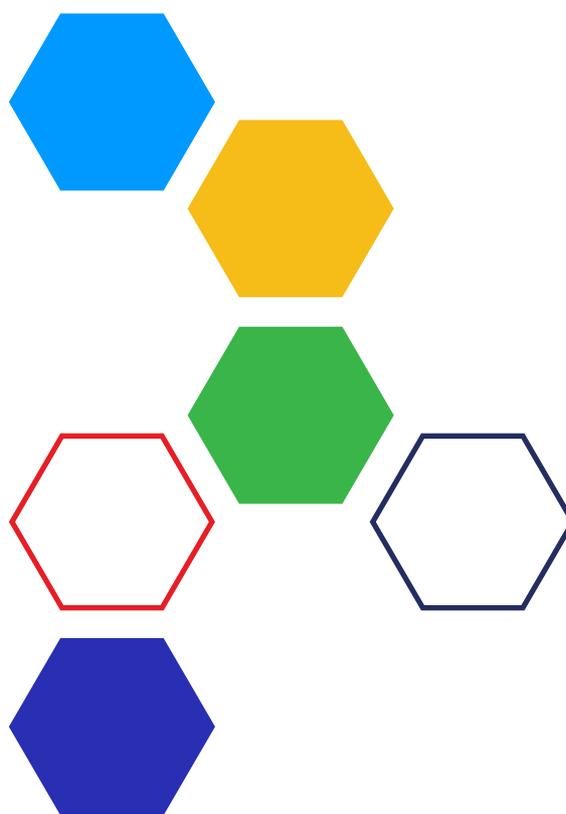
²³ Some stakeholders choose to spell the plural of “competence” as “competencies,” and others “competences.” The variation in spelling in this paper reflects each stakeholder's overall preference.

²⁴ For a comprehensive review of how DigComp2.1 is being implemented in countries in and outside of Europe, please see Kluzer and Pujol Priego (2018).

setting. He initially created his definition in response to the inclusion of digital competence as one of the five basic core competences in Norway's national curriculum (Krumsvik, 2008). According to Krumsvik (2012), digital competence is defined as "the individual teacher's proficiency in using ICT in schools with good pedagogical judgement, and his/her awareness of its implications for learning strategies and the digital Bildung²⁶ of pupils" (p. 466). Thus, while Calvani and colleagues (2012) propose a more general definition of digital competence, listing a variety of cognitive abilities, Krumsvik's definition centers on teachers' level of expertise in using ICT for professional means and the implications this usage has on student learning.

Some scholars view digital competence as more closely related to other literacies. As Ferrari, Punie, and Redecker (2012) note, there are generally two camps around the digital competence (and digital literacy) discourse. One perspective views digital competence as the convergence of several related literacies, such as media, information, Internet, and computer literacy (Ala-Mutka, 2011). Others, however, hold that digital competence is a new literacy that extends beyond the sum of related literacies, such as information and media literacy (Ferrari, 2012; Gallardo-Echenique, de Oliveira, Marques-Molias, & Esteve-Mon, 2015). Livingstone (2003), for instance, notes that literacy itself is primarily dependent on tools and objects, and given the rapid proliferation of new tools and technologies, the competences needed to navigate them are changing. In this vein, Kress (2010) holds that digital technologies necessitate new approaches to both audio and visual text. As Ferrari (2012) points out, digital technologies now

allow for "a convergence between the reader and the writer, as the decoding and encoding processes are made at faster speeds and texts – blogs, newspaper articles, Wikipedia entries – allow and encourage the reader to become an author" (p. 19). Thus, in this perspective, digital competency is an evolving concept that is bound neither to specific literacies nor to the convergence of such literacies, but to the tools or objects in one's environment.



²⁵ "Technological" knowledge is measured by indicators such as the ability to recognize interfaces and symbols and solve common technical issues, as well as a conceptual understanding of technology; "cognitive" knowledge by, for example, the ability to organize data and critically evaluate information; and "ethical knowledge" through level of respect for others, an understanding of privacy online, and an understanding of digital inequities across countries (both the extent and how it impacts individuals' ability to communicate with others) (Calvani et al., 2012).

²⁶ Krumsvik (2008) proposes the following definition: "Digital Bildung [digital danning in Norwegian] focuses on how pupils' participation, multi-membership of different communities and identity development in the digital era are influenced by the digitisation of society" (p. 288). In the context of the school setting, according to Krumsvik (2008), both teachers and students can practice digital competence by critically consuming information online, and developing an ethical understanding of the social ramifications of digital technologies.

III. MAPPING OF DIGITAL CITIZENSHIP FRAMEWORKS

As noted, over the past two decades we have seen the emergence of a range of digital citizenship frameworks, addressing relevant skills that aim to help young people critically, ethically, and effectively use digital technologies. While we have decided to develop a framework around the term “digital citizenship+ (plus),”²⁷ we are mindful of how others in government, international organizations, NGOs, and academia have developed and applied their own frameworks addressing digital citizenship and its associated skills. Against this backdrop, we selected and studied 35 frameworks around digital citizenship and intersecting concepts such as media literacy, 21st century skills, and online safety. In this part III, section 1, we describe the process we used to select the frameworks and

how we mapped the frameworks onto areas of life related to the digital landscape — such as civic and political engagement, artificial intelligence, and privacy and reputation. Section 2 showcases the results we derived from that analysis — more specifically, the 17 areas of life our current digital citizenship+ (plus) framework includes and that we feel future digital citizenship frameworks, and frameworks on similar concepts, should address. Additionally, this section illustrates a possible way to group these 17 areas, and how they may be applied in practice, with a focus on the educational space. Section 3 incorporates the visualization that positions our findings within this complex landscape of frameworks and skills.

1. THE MAPPING PROCESS AND CREATION OF DIGITAL CITIZENSHIP+ (PLUS)

This part III, section 1 describes the process we used to map frameworks addressing digital citizenship and similar concepts, and how we created our own conceptualization of digital citizenship: digital citizenship+ (plus).

1. Initial Broad Search of Frameworks

We first performed searches across an array of databases using general keywords in varying combinations of “youth” and “teenagers,” “digital citizenship” or a term related to digital citizenship, such as “media literacy,” “21st century skills,” or “online safety,” and “framework,” “definition,” or “initiative.”

Our search strategy also involved combinations of “digital citizenship,” “youth,” and “[specific country]” search terms. We searched for digital citizenship frameworks both within the U.S. and around the world (e.g., Spain, New Zealand, and Singapore) and from a diverse range of stakeholders (i.e., government, international organizations, NGOs, and academia). Due to our rapidly evolving technological landscape, we generally focused our searches on frameworks published in the past decade, but also explored widely cited frameworks that are slightly older (e.g., Mossberger and colleagues’ conceptualization of digital citizenship, put forth in 2007).

²⁷ The rationale behind why we decided to use the term “digital citizenship+ (plus)” is described in part I, section 6, and the manner in which we developed our framework around this term and how we define the term is elaborated upon in this part III, sections 1 and 2, respectively.

2. Selection of a Subset of Frameworks

For the framework mapping itself, we decided to reduce the initial large number of frameworks and study a subset of 35 in further detail (see Appendix A), based on two main criteria. First, our subset of selected frameworks translated their definitions of digital citizenship (or a related concept) into action through 1) educational materials and/or programming, 2) a report or study, and/or 3) legislation. Second, the frameworks focused on youth ages 12-18 (we retained some of the frameworks that were designed with primarily adults or the general public in mind but were very much applicable to youth as well).

3. Initial Identification of Areas of Life²⁸ Connected to the Digital World (Bottom-up)

To systematically organize the frameworks we selected, we adopted a bottom-up strategy by identifying what areas of life each framework incorporated. We initially mapped frameworks along a set of approximately 25 areas (e.g., civic and political engagement, positive/respectful behavior, safety and well-being).

4. Inclusion of Additional Areas of Life Based on YaM's Work (Top-down)

We then adopted a top-down approach. We compared the initial 25 areas with YaM's own research, advocacy, and development initiatives around young people and digital technology. Based on this comparison, we worked with Berkman Klein Center fellows, staff, and youth from the Center's 2017 summer internship program to collectively identify 15 additional areas perceived to be important in navigating the digital world (e.g., artificial intelligence, digital economy; see Appendix B for the full list of 40 areas).

5. Clustering and Grouping the Areas

We organized several collaborative and engaging sessions with fellows, staff, and summer interns to arrange the 40 areas into broader themes by

grouping similar areas under the same overall umbrella heading (e.g., "the engaged Internet," "the interpersonal Internet"). Please see Appendix C for photos from these sessions.

6. Parallel Deep Dive into Scholarly Work

In parallel with these sessions, we reviewed a body of literature to understand how other scholars are defining and discussing areas such as safety and well-being (Livingstone, Mascheroni, Ólafsson, & Haddon, 2014), civic and political engagement (Levine, 2007), and media literacy (Hobbs, 2010). We ultimately arrived at our current list of 17 areas that we term "digital citizenship+ (plus)."

7. Assessing Youth Involvement in the Frameworks

Based on YaM's premise that involving young people's perspectives is essential to shaping research, education, and policy frameworks and practices geared towards youth, we examined whether youth ages 12-18 were involved in the development of each framework we selected. We operationalized "youth involvement" as young people providing input in the curation of the framework through direct means (e.g., directly telling researchers what areas of life related to the digital environment are personally meaningful) or indirect means (e.g., participating and providing feedback on a pilot digital citizenship curriculum implemented in schools). As stated in point two in this part III, section 1, the vast majority of frameworks we selected were designed by youth-serving stakeholders. In other words, these stakeholders developed their framework and the associated content (educational materials and/or programming, a report or study, and/or legislation) to apply it within a youth setting, such as a formal or informal learning environment. In assessing youth involvement, however, we draw a distinction between stakeholders who develop content to be used primarily by youth versus those who create content to be used by young people and *involve youth in the development process itself*.

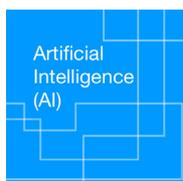
²⁸ We define an area of life as a facet of life with associated skills that help one thrive academically, socially, ethically, politically, and/or economically in our rapidly evolving digital world.

2. THE 17 AREAS THAT CURRENTLY CONSTITUTE DIGITAL CITIZENSHIP+ (PLUS)

We define “digital citizenship+ (plus)” as the skills needed for youth to fully participate academically, socially, ethically, politically, and economically in our rapidly evolving digital world.

The 17 areas that make up digital citizenship+ (plus) are described in this part III, section 2. Additionally, we provide examples of how several of these areas might be applied within a formal learning setting. We use five subject areas to illustrate this application: history, English, science, math, and world language. For each application, we also indicate a specific educational tool our team has developed that one can use to engage youth in the activity. We also offer examples of ways our educational tools might be grouped in engaging and interesting ways, which can be applied in formal or informal learning spaces.

To view all of the 100+ educational tools (e.g., learning experiences, podcasts, visualizations) we have developed around these 17 areas, please visit our team’s Digital Citizenship+ (Plus) Resource Platform at <https://dcrp.berkman.harvard.edu>. From the home to the classroom to the libraries and museums, our team’s educational tools can be used in different settings for both individual and group learning (Cortesi, Lombana, & Hasse, 2018). We have designed the tools with and for youth – with the help of internal and external experts, Youth Advisors (i.e., groups of youth from different contexts who help shape YaM’s efforts), summer interns, and research assistants – and have embedded the principles of connected learning (Ito et al., 2013; Ito et al., 2020) within them.

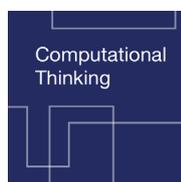


Artificial Intelligence (AI): The ability to understand the algorithms involved in the AI-based platforms one interacts with, and the ethical conversations happening around the development of these technologies.



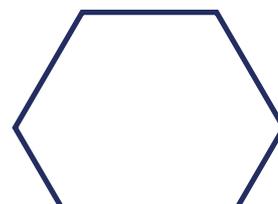
Civic and Political Engagement:

The ability to participate in public matters (e.g., LGBTQ rights, peace-building, addressing hate speech) and advocate for issues one cares about – using digital and non-digital tools – ideally to improve the quality of life in one’s community, from micro to macro levels (Levine, 2007).



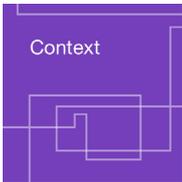
Computational Thinking:

The ability to understand and apply computational concepts, practices, and perspectives. Computational concepts include concepts individuals leverage as they program (e.g., “sequencing,” or identifying a set of steps for a task; “loops,” or running the same series of steps multiple times). Computational practices represent the practices individuals cultivate while they program (e.g., “experimenting and iterating;” “reusing and remixing,” or creating something by building upon current ideas or projects). Finally, computational perspectives refer to the perspectives individuals develop about themselves, their connections to others (such as within the context of collaborative online communities), and the technological world more broadly (e.g., “connecting,” or understanding the power of developing content both with and for others) (Brennan & Resnick, 2012).





Content Production: The ability to produce (digital) content using (digital) tools.



Context: The ability to be aware of, understand, and interpret the contextual factors of relevance (e.g., cultural, social, local/regional/global) in a given situation – with a particular emphasis on the experiences and perspectives of underrepresented groups, whether in terms of age, ethnicity, race, gender and sexual identity, religion, national origin, location, skill and educational level, and/or socioeconomic status – and effectively engage in the situation.



Data: The ability to be aware of, create, collect, represent, evaluate, interpret, and analyze data from digital and non-digital sources.



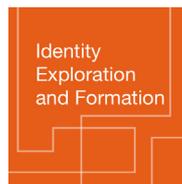
Digital Access: The ability to connect to and access the Internet, individually or collectively (e.g., mesh technologies).



Digital Economy: The ability to navigate economic activities online and offline to earn different forms of economic, social, and/or cultural capital (e.g., earning money, increasing social connections, building personal brands).



Digital (Literacy): The ability to use the Internet and other digital tools and platforms effectively to find, interact with, evaluate, create, and reuse information (Palfrey & Gasser, 2016). The ability to comprehend and work through conceptual problems in digital spaces (Carretero et al., 2017).



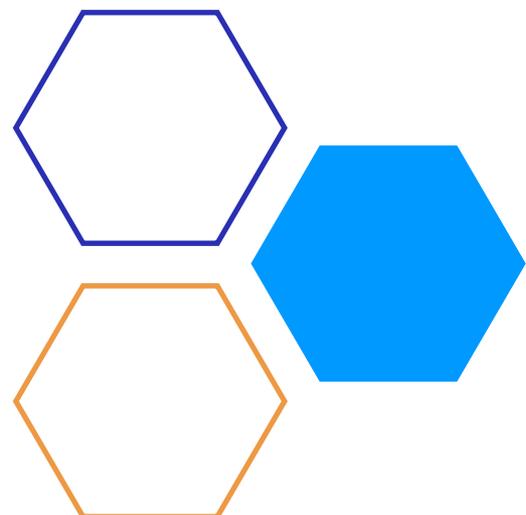
Identity Exploration and Formation: The ability to use (digital) tools to explore elements of one's identity and understand how the communities one is part of shape one's identity.



Information Quality: The ability to find, interact with, evaluate, create, and reuse information (broadly speaking, e.g., news, health information, personal information) effectively (Palfrey & Gasser, 2016).



Law: The ability to engage with legal frameworks, concepts, and theories surrounding the Internet and other digital tools (e.g., copyright, fair use), and the ability to apply these frameworks to one's activities.





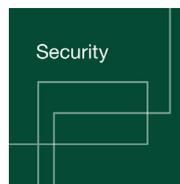
Media (Literacy): The ability to analyze, evaluate, circulate, and create content in any media form (e.g., print, visual, interactive, audio), and to participate in communities and networks. “Media literacies,” in the plural, include “media literacy” (Hobbs, 2010), what some researchers have conceptualized as “new literacies” (Lankshear & Knobel, 2007), and “new media literacies” (Jenkins et al., 2006). That is, they encompass literacy approaches that not only focus on individual engagement with media (media literacy) but also that address community involvement and participatory cultures. “Media literacies” also include literacies such as reading and writing.



Safety and Well-being: The ability to counteract the risks that the digital world may come with to protect one’s physical and mental well-being (e.g., guarding against Internet addiction and repetitive stress syndrome). Online risks can be classified along three main dimensions: conduct (e.g., cyberbullying, sexual harassment/unwelcome “sexting”); contact (e.g., face-to-face meeting after online contact, communication with individuals pretending to be another person); and content (e.g., exposure to pornographic content, violent or aggressive content, harmful speech, content about drugs, racist content) (Livingstone, Kirwall, Ponte, & Staksrud, 2014).



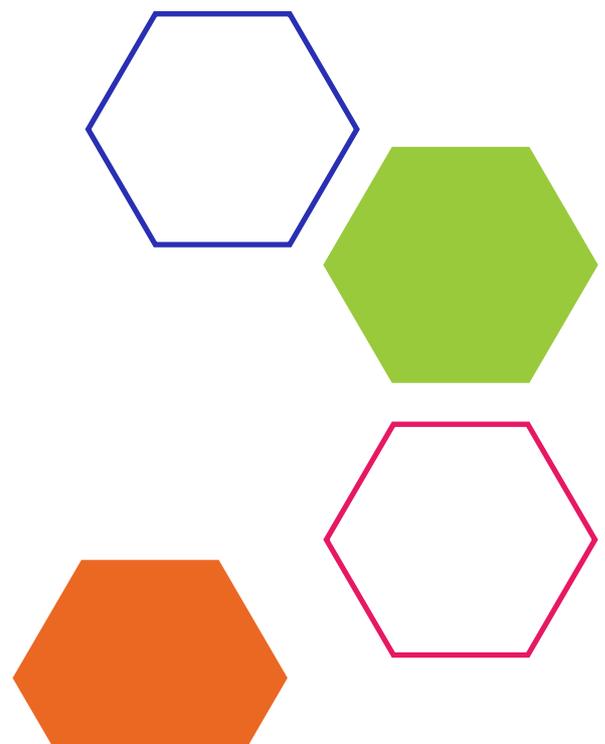
Positive/Respectful Behavior: The ability to interact with others (both individuals and the larger collective (James, 2014)) online in a respectful, ethical, socially responsible, and empathic manner.



Security: The ability to protect the integrity of one’s information, digital devices, and assets (e.g., login information such as passwords, profiles, websites).



Privacy and Reputation: The ability to protect one’s personal information online, and that of others. An understanding of the digital “trail” left behind as a result of the activities one engages in online, the short- and long-term consequences of this trail, the appropriate management of one’s virtual footprint, as well as an understanding of inferred data (i.e., new data derived from capturing and analyzing other data points, which may result in new knowledge about a person (van der Hof, 2016)).



THE AREAS APPLIED IN A SCHOOL CONTEXT

Civic and Political Engagement/History » Make a comparison between a historical social movement and a more recent one. Ask students: how did people communicate with each other within the movement? How were the movements covered in the media? As part of this exercise, you could introduce students to the “[Hashtags](#)” learning experience.

Digital Economy/Science » Online media that teaches about various scientific concepts has grown popular. YouTubers, bloggers, and personalities like Bill Nye and Neil deGrasse Tyson utilize digital communication tools to build an online brand that makes complex scientific ideas accessible to a mass audience. With your students, identify how these popular science online content creators establish trust with their audience, how they cite scientific information, and the different strategies they use to make their content entertaining for their audience. Discuss the skills students think are involved in developing this content (e.g., research, creative thinking, media production). Using these best practices, have your students create content for a popular science YouTube channel, webpage, or blog, and have them reflect on some of the skills they developed in this process. Discuss the differences in preparing content for a science-professional audience vs. a general population audience. As part of this exercise, you could introduce students to the “[Identifying Our Strengths](#)” learning experience.

Identity Exploration and Formation/English » Have students create a social media profile for characters in a literary text the class is reading. Ask students to choose the profile picture, handle or username, and compose the “About Me”

section, friends list, and a few sample posts and/or images the character would share. Consider having multiple students create a profile for the same character and then have the class compare and contrast each of the profiles created. Why did the students make the decisions they made about what to include in the profile they created? As part of this exercise, you could introduce students to the “[Online Presence](#)” learning experience.

Information Quality/Math » Identify a news story that presents a mathematical concept in an unclear way. A good example of this is a misleading statistic. Have students identify the source of the statistic (e.g., from what research article is the statistic from?). Do they see the statistic presented in other news stories? If so, encourage students to make a timeline of the sources where this statistic appeared. Discuss: across the different sources, what potentially motivated the use of the statistic? What is the impact (potential or actual) of including such a statistic in the story/stories? As part of this exercise, you could introduce students to the “[Beyond the Original](#)” learning experience.

Security/English » Have students write persuasive essays on a security-related topic. An example could include students arguing for or against connecting personal devices to the school Wi-Fi network. In the process, students will likely interact with technical texts. One of their goals will be to make this information understandable to a general audience. As part of this exercise, you could introduce students to the “[Public Wi-Fi](#)” learning experience.



THE AREAS IN SETS OF EDUCATIONAL TOOLS

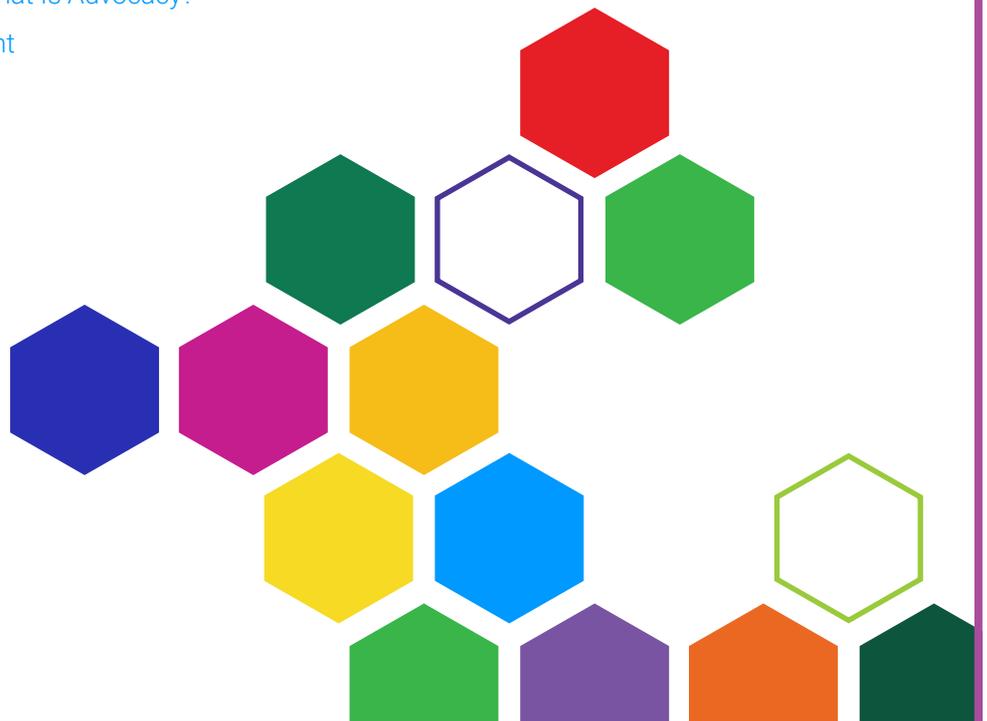
Our learning experiences and other educational tools can be mixed and matched in countless ways. Just as examples, imagine the following two scenarios:

Scenario 1. You are an organization whose mission is to reverse the increasing gender digital divide and empower women and girls in acquiring skills that will help them become both ICT users and creators in the digital world. You have an afternoon to work with a group of young women – some of the themes you may want to reflect on might include: social media habits; how others may perceive what they post online; ways they can present themselves differently online to different people; and how they can feel more empowered to tackle changes they want to see in their communities. Here is a grouping of activities, along with an assignment, that could be interesting:

- [15 minutes] Activity: [Social Media Use](#)
- [40 minutes] Activity: [Thinking Caps](#)
- [20 minutes] Activity: [Reflections on Perspective](#)
- [30 minutes] Activity: [What Is Advocacy?](#)
- [50 minutes] [Assignment](#)

Scenario 2. You are working on a project that harnesses the power of creative arts for youth and community development. Once a week, you work closely with young artists and cultural creatives as they use their creativity to bring the community together for dialogue and action. Here is a grouping of activities, along with an assignment, that you might find helpful to engage in with the youth you mentor to show how various types of media can be used to promote awareness around an issue:

- [15 minutes] Activity: [Using Media for Change](#)
- [15 minutes] Activity: [Activism Using Hashtags](#)
- [15 minutes] Activity: [Knowing How Reverse Image Search Works](#)
- [65 minutes] [Assignment](#)



A POSSIBLE GROUPING

Here, we provide a possible way to group the 17 areas of life that comprise “digital citizenship+ (plus)” into four clusters: 1) participation, 2) empowerment, 3) engagement, and 4) well-being. Although this clustering may help highlight common themes among certain areas, we prefer to retain focus on the areas themselves, versus the groupings.

1. Participation

- Digital Access
- Digital (Literacy)
- Content Production
- Security
- Law

3. Engagement

- Digital Economy
- Data
- Computational Thinking
- Artificial Intelligence

2. Empowerment

- Civic and Political Engagement
- Context
- Information Quality
- Media (Literacy)

4. Well-being

- Privacy and Reputation
- Identity Exploration and Formation
- Positive/Respectful Behavior
- Safety and Well-being

1. Participation

The educational tools under this grouping help youth understand how to get connected to the Internet; use the Internet and other digital tools and platforms to find, interact with, evaluate, create, and reuse information; and produce content online. The tools also help youth protect their digital devices and assets, and understand and apply legal concepts to the digital environment.

Areas: Digital Access, Digital (Literacy), Content Production, Security, and Law.

2. Empowerment

The educational tools under this grouping help youth participate in public matters and advocate for issues they care about; develop the ability to be aware of and interpret the contextual factors of relevance (e.g., cultural, social, local/regional/global) in a given situation and effectively engage in it; and find, evaluate, create, and share information and other content in different media forms.

Areas: Civic and Political Engagement, Context, Information Quality, and Media (Literacy).

3. Engagement

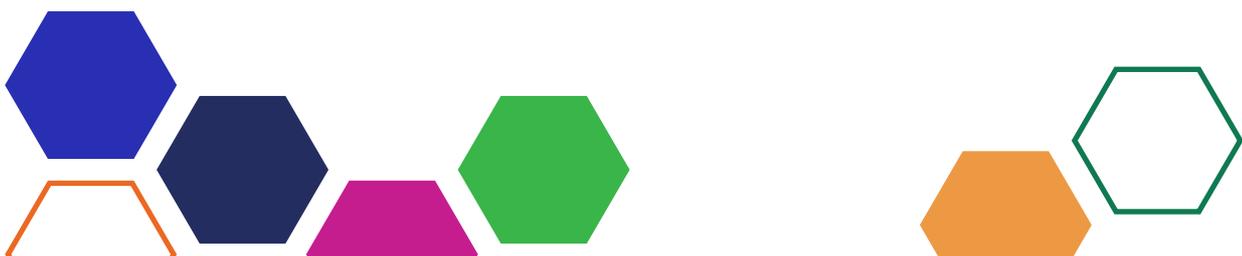
The educational tools under this grouping help youth cultivate the ability to navigate economic activities online and offline; engage in data creation, collection, interpretation, and analysis; understand and apply computational concepts; and understand and take part in conversations around artificial intelligence.

Areas: Digital Economy, Data, Computational Thinking, and Artificial Intelligence.

4. Well-being

The educational tools under this grouping help youth protect their personal information online (and that of others); explore their identity; engage with others (both individuals and the larger collective) online in empathic, ethical, and positive ways; and counteract the risks the digital environment may come with to protect their physical and mental health.

Areas: Privacy and Reputation, Identity Exploration and Formation, Positive/Respectful Behavior, and Safety and Well-being.



3. A VISUALIZATION OF OUR FINDINGS WITHIN THE 35 FRAMEWORKS

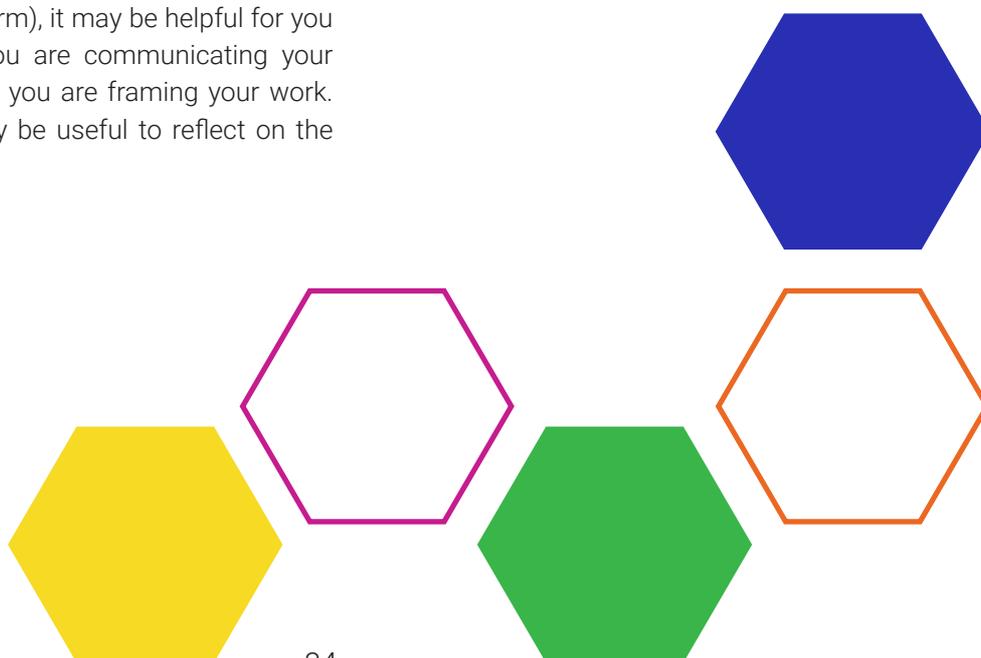
The visualization in this part III, section 3 aims to illustrate part of the current digital citizenship dialogue. The 17 areas of life connected to the digital environment that YaM used to organize these frameworks are listed on the horizontal axis. To the far right, “Youth Involvement” indicates whether or not youth (12-18-year-olds) were involved in the development of each framework. Selected stakeholders who have developed a digital citizenship framework (or a framework on a related concept, listed under “Other Frameworks”) are displayed on the vertical axis.

It is important to keep in mind that this visualization does not represent a value judgment of the frameworks within it. We selected the frameworks because we feel that each represents a significant contribution to the field of youth and digital technologies, and, as noted in this part III, section 1, has resulted in an action-oriented output(s) (i.e., educational materials and/or programming, a report or study, and/or legislation). The explicit inclusion of a greater number of areas in one framework versus another does not make one framework “better” – each is shaped by specific guiding principles and beliefs, which vary across the landscape of frameworks included in this visualization.

That being said, if you have worked or are planning to work on digital citizenship (and you explicitly would like to use that term), it may be helpful for you and those to whom you are communicating your efforts to consider how you are framing your work. More specifically, it may be useful to reflect on the following questions:

1. Is your work meant to be holistic and cover a wide array of areas? If so, how did you decide which ones to focus on, and for what reasons?
2. Alternatively, is your work a more specific effort, focusing on a smaller subset of areas? Again, if so, how did you decide which ones to focus on, and for what reasons?
3. Do you feel that the term “digital citizenship” reflects the areas included within your framework? If so, why? If not, might there be ways to adjust the areas included in your framework and/or the overall term you’re employing?

We also recognize that frameworks around digital citizenship and related concepts will continue to evolve. Against this backdrop, we welcome further discussion around the areas that various stakeholders deem important in the context of young people and the digital world. If your framework is represented in the visualization and you plan to modify the content, please do not hesitate to reach out to us – we would be most happy to include your updated work in further versions of the visualization. Additionally, if you have developed a digital citizenship framework, or a framework on a similar concept, and would like for your work to be represented in future versions, please feel free to contact us.



Youth and Media

ABOUT

This visualization illustrates the frameworks mapped as part of the *Youth and Digital Citizenship+ (Plus)* spotlight by Youth and Media (YaM) at the Berkman Klein Center for Internet and Society. One side illustrates the 17 areas of life connected to the digital world YaM used to organize these frameworks and whether or not youth (12- to 18-year-olds) were involved in the development of each framework. The other side lists each stakeholder, their sector(s), and location.

KEY

- Government
- Academia
- International Organization
- Non-governmental Organization
- Area/inclusion is explicitly stated, based on our framing
- Less clear if included based on our framing
- Area/inclusion is not explicitly stated, based on our framing

DIGITAL CITIZENSHIP FRAMEWORKS

Framework	Government	Academia	International Organization	Non-governmental Organization	Area/inclusion is explicitly stated, based on our framing	Less clear if included based on our framing	Area/inclusion is not explicitly stated, based on our framing
Common Sense and Project Zero (U.S.)							
DQ Institute (Singapore)							
Enlaces (Chile)							
EU Kids Online							
Global Digital Citizen Foundation (Canada)							
International Society for Technology in Education (U.S.)							
Jones, Lisa and Mitchell, Kimberly (U.S.)							
Lindsay, Julie and Davis, Vicki (Australia and U.S.)							
Media Literacy Now (U.S.)							
Mossberger, Karen; Tolbert, Caroline; and McNeal, Ramona (U.S.)							
Netsafe New Zealand							
New South Wales Department of Education (Australia)							
PantallasAmigas (Spain)							
Ribble, Mike (U.S.)							
UNICEF							
Washington State Legislature							

ROTATE TO FOCUS ON AREAS

- Artificial Intelligence (AI)
- Civic/Political Engagement
- Computational Thinking
- Content Production
- Context
- Data
- Digital Access
- Digital Economy
- Digital (Literacy)
- Digital Exploration
- Identity
- Information Quality
- Law
- Media (Literacy)
- Media Literacy
- Positive Behavior
- Privacy and Reputation
- Safety and Well-being
- Security
- Youth Involvement

OTHER FRAMEWORKS

Framework	Government	Academia	International Organization	Non-governmental Organization	Area/inclusion is explicitly stated, based on our framing	Less clear if included based on our framing	Area/inclusion is not explicitly stated, based on our framing
Child Exploitation and Online Protection Command (U.K.)							
Convergence Design Lab (U.S.)							
CyberSecurity Malaysia							
European Commission							
Good Play Project and Project New Media Literacies (U.S.)							
Hobbs, Renee (U.S.)							
International Computer Driving License (ICDL) Foundation							
Malaysian Communications and Multimedia Commission							
Means and Measures of Human Achievement Labs (U.S.)							
MediaSmarts (Canada)							
Media Literacy Council (Singapore)							
National Association for Media Literacy Education (U.S.)							
National Coalition for Core Arts Standards (U.S.)							
Partnership for 21st Century Learning (U.S.)							
Singapore Ministry of Education							
Spy Hop Productions (U.S.)							
UNESCO							
World Bank							
World Economic Forum							

INFO

One can view this visualization by individual framework, multiple frameworks, and/or area(s). To learn more, please see the full spotlight. If you would like your framework to be added to this visualization or you feel that your work has not been accurately represented, please do not hesitate to email YaM at youthandmedia@cyber.harvard.edu.

IV. CONSIDERATIONS



Based on our digital citizenship mapping exercise described in part III, we note six important observations that may be helpful in the development and deployment of digital citizenship frameworks, and frameworks addressing other concepts (e.g., digital literacy, 21st century skills). In section 1, we present a brief overview of several terms that various stakeholders use to describe how an individual masters an area of life connected to the digital world (e.g., “skills,” “literacies,” “abilities,” etc.) and how the term(s) relates to the overall goal of the framework. In section 2, we explain that while we designated 17 areas (presented in part III, section 2), it is important to keep in mind the highly interconnected nature of these areas. In section 3, we demonstrate how it may be helpful to take into account contextual factors — including age,

ethnicity, race, gender and sexual identity, religion, national origin, location, skill and educational level, and/or socioeconomic status — in how youth engage with digital citizenship efforts. In section 4, we describe how the current digital citizenship discourse may benefit from a broadened scope to encompass additional educational, economic, and cultural opportunities available online to young people today. In section 5, we note the importance of including young people in the curation of digital citizenship initiatives to ensure these opportunities are tailored to their diverse backgrounds, needs, and interests. And in section 6, we observe that once digital citizenship initiatives are implemented, it may be useful to consider how to assess the skills youth acquire over time as they engage with the materials associated with the frameworks.

1. UNDERSTANDING OF THE LENS AND CONNECTED TERMS

Our framework mapping has intentionally had a thematic lens, meaning we identified 17 areas of life we feel are currently relevant and important to address. In part III, section 2, we define what we mean by each area, where each area is presented as a noun. We acknowledge, however, that in several cases, framing an area as a noun has been difficult as these nouns rarely stand alone in an educational context — often, the words “literacy” or “competency” are attached to the noun. This was particularly relevant for digital (literacy/competency) and media (literacy), though we also ran into similar considerations around the areas of data and information quality. However, for consistency reasons, we decided to designate each thematic area as a noun, placing “literacy,” even in the

two most challenging cases, in parentheses after the area (i.e., digital (literacy) and media (literacy)).

One of the main challenges we encountered when thinking about how to frame each area centered on how to define a “literacy,” versus a “competency” (the latter, in the plural, often referenced by others as “competencies” or “competences”), versus a “skill/set of skills.” When reviewing the frameworks we mapped in part III, section 3, we noticed that the main term that a framework utilizes varies — whether that might be a digital “skill,” “literacy,” or “competency.” So too, do definitions of each term.

Let us turn now to a few examples of how the conceptualization of these terms varies.

Van Deursen (2010), for instance, defines digital literacy as consisting of competencies and knowledge, while digital skills encompass the applied aspects of such competencies and knowledge.²⁹ Van Dijk and van Deursen (2014) prefer the term “skills” over “literacies” and “competencies” as they feel that the word “skills” implies a more interactive engagement with media than, for instance, the word “literacy,” which they associate with traditional print literacy (i.e., reading and writing texts).

According to van Deursen (2010) and van Dijk and van Deursen (2014), in the context of the digital environment . . .

Literacy =

- Competence
- Knowledge
 - » Applying competencies and knowledge requires skills

Others view digital skills under the overall umbrella of digital competence. For instance, according to the European Commission’s DigComp 2.1 framework³⁰ (Carretero et al., 2017), a “competence” is comprised of knowledge, skills, and attitudes. More specifically, “knowledge” refers to the “body of facts, principles, theories and practices . . . related to a field of work or study;” “skills” address the application of this knowledge and are described as “practical (involving manual dexterity and the use of methods, materials, tools and instruments)” and “cognitive (involving the use of logical, intuitive, and creative thinking);” and “attitudes” include the values and goals that motivate one’s performance (Vuorikari, Punie, Carretero, & Van den Brande, 2016, p. 39).

²⁹ For a more in-depth look at van Deursen’s framework around digital skills, please see part II, section 1.

³⁰ To learn more about the DigComp 2.1 framework, please see part II, section 4.

According to Carretero et al. (2017), in the context of the digital environment . . .

Competencies =

- Attitude
- Knowledge
- Skills = application of knowledge
 - » Cognitive
 - » Practical

The OECD Learning Compass 2030 also clusters skills, attitudes and values, and knowledge under “competencies.” “Skills” are defined as “the ability and capacity to carry out processes and be able to use one’s knowledge in a responsible way to achieve a goal” (OECD, 2019, p. 13). And “knowledge” encompasses “theoretical concepts and ideas in addition to practical understanding based on the experience of having performed certain tasks” (2019, p. 13). “Attitudes and values” are defined as the “principles and beliefs that influence one’s choices, judgements, behaviours and actions on the path towards individual, societal and environmental well-being” (2019, p. 13). According to the OECD, knowledge, skills, and attitudes and values are not competing concepts; they are developed interdependently – for instance, attitudes and values often influence the transfer of knowledge and skills.

According to the OECD (2019), in the context of the digital environment . . .

Competencies =

- Attitudes and values (which influence an individual’s choices, judgements, and actions)
 - » Personal
 - » Social
 - » Societal
 - » Human
- Knowledge
 - » Disciplinary
 - » Interdisciplinary
 - » Epistemic
 - » Procedural
- Skills
 - » Practical and physical
 - » Cognitive and meta-cognitive
 - » Social and emotional

A detailed history of the conceptual debate around “literacy,” “competency,” and “skill” is beyond the scope of this paper – ideally, this section (and the simplified illustrations) showcases just some of the ways these terms are operationalized differently. For the purposes of this paper and our ongoing work, we chose to work with the term “skills” and disregarded other terms and concepts to reduce complexity. We are working with the term “skill” as defined by the OECD. According to the OECD (2018), “skills” encompass 1) practical (e.g., utilizing new digital technology devices) and physical (e.g., using a digital device, such as a tablet or mobile phone, to achieve a specific outcome, like finding information online for a school assignment) skills, 2) social and emotional skills (e.g., collaboration, self-efficacy, empathy), and 3) cognitive and meta-cognitive skills (e.g., self-regulation, motivation to learn, creativity, and critical thinking) (p. 5). Under the umbrella of practical and physical skills, we interpret the capacity to “use technological devices” as the ability to connect to the Internet, access resources and information, set up accounts/profiles, and operate digital device software and hardware (e.g., turning on a computer or mobile device, typing on the keyboard, knowing how to use spreadsheets and word processing applications) (Broadband Commission for Sustainable Development, 2017). To cognitive skills, we would also add an understanding of an area (e.g., understanding what an algorithm is, or determining if a work is in the public domain). In the definitions of our 17 areas of life in part III, section 2, we use the term “ability” to refer to the capacity to apply practical and physical, cognitive and meta-cognitive, and social and emotional skills to engage in the activities specified for each area.

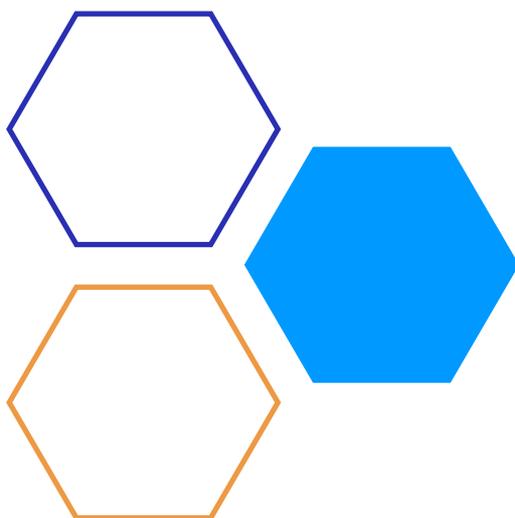
According to our YaM team, in the context of the digital environment . . .

Ability =

- Capacity to apply the following skills...
 - » Practical and physical
 - » Cognitive and meta-cognitive
 - » Social and emotional
- To engage in the activities specified in YaM’s 17 areas of life, such as...
 - » Understanding the algorithms involved in the AI-based platforms one interacts with (Artificial Intelligence)
 - » Interacting with others (both individuals and the larger collective) online in a respectful, ethical, socially responsible, and empathic manner (Positive/ Respectful Behavior)

While our team adopts the OECD framing for skills, there is a myriad of other ways to conceptualize skills and skill sub-categories – some of which are framed in the context of Internet use, while others are operationalized in a broader sense. As elaborated upon in part II, section 1 of this paper, for example, van Dijk and van Deursen (2014) define skills in the context of Internet usage along six dimensions: 1) operational skills, 2) formal skills, 3) informational skills, 4) strategic skills, 5) content creation skills, and 6) communication skills (van Deursen et al., 2014; van Dijk & van Deursen, 2014). More broadly, as described in part II, section 3, P21 (2019) conceptualizes three categories of skills: 1) learning and innovation skills, 2) life and career skills, and 3) information, media, and technology skills. These sets of skills are complemented by content knowledge around domains including math, science, English, and other subjects.

Still others adopt an approach that divides skills into “hard skills” and “soft skills.” As Goodspeed (2016) points out, one way some have operationalized “hard skills” and “soft skills” has been “hard cognitive skills” and “soft behavioral/dispositional skills.” Hard cognitive skills may be viewed as the capacity to “interpret, reflect, reason, think abstractly, and assimilate



complex ideas, solve problems and generalize from what is learned” (Ayrton Senna Institute & UNESCO, 2014, p. 9). In practical terms, they often include content knowledge, as well as higher-order thinking measured by grades or standardized achievement assessments (Goodspeed, 2016). By contrast, soft skills often encompass individuals’ capacity “to relate to others and themselves, understand and manage emotions, set and attain goals, make autonomous and responsible decisions, and creatively and constructively confront adverse situations” (Ayrton Senna Institute & UNESCO, 2014, p. 9). Researchers refer to “soft skills” in a wide array of ways, including “social and emotional skills,” “non-cognitive skills,” and “character skills,” and they define these skills in different ways. Regardless of the debate around the meaning of soft skills and the varying terms used, soft skills are unique in that they are 1) conceptually distinct from hard cognitive skills (soft skills are perceived as beneficial to individuals and society at large) and 2) expressed in different ways depending on the context (Duckworth & Yeager, 2015). Though our team does not adopt the “hard skills” versus “soft skills” distinction, if this framing is useful, we suggest that you think of “practical and physical” and “cognitive and meta-cognitive” skills as hard skills and “social and emotional” skills as soft skills.

Additionally, it is important to note that we don’t draw an online/offline distinction in the way we conceptualize the skills associated with the areas in part III, section 2. As Palfrey and Gasser

(2016) point out, many youth are “living partly in a digital environment and partly in a face-to-face environment. From their perspective, there is no ‘online life’ and ‘offline life.’ There’s just ‘life’” (p. 341). In the context of young people’s online and offline social networks, for instance, research indicates an overlap (Reich, Subrahmanyam, & Espinoza, 2012; Subrahmanyam, Reich, Waechter, & Espinoza, 2008). Against this backdrop, we view skills related to offline activities as part of digital citizenship+ (plus) if they can be applied to the digital landscape. Some frameworks that we examined framed the area of positive/respectful behavior, for instance, in general terms, such as “social awareness.” According to the Means and Measures of Human Achievement (MHA) Labs, “social awareness” encompasses capacities such as understanding the consequences of one’s actions and taking into account norms associated with different cultures and contexts (MHA Labs, n.d.). We feel that if someone engages in social awareness, as defined by MHA Labs, with others offline, they could potentially apply these skills as they interact with others online.

As you develop or build upon a program or initiative on digital citizenship or a related concept, we recommend that you are somewhat critical of these terms – whether you use “skill,” “literacy,” “competency,” or another similar term. It may be helpful to reflect on what these terms mean to you and why you might prefer a certain term(s) over others.

2. RECOGNIZING THE INTERCONNECTEDNESS OF AREAS

From our framework mapping process, we derived a list of 17 areas that are designed to act as a helpful guide in thinking about how to equip youth with the skills needed to be able to navigate areas of life connected to the digital environment. While each area represents a single category of activity, it is helpful to keep in mind that many of these areas intersect. In exploring identity online, for instance, young people have the opportunity to “brand” themselves on different digital platforms by producing an array of content – sharing status updates on Facebook,

posting photos on Instagram, or, on the more active spectrum, creating and uploading videos to YouTube. These “intentional digital contributions . . . are central to a young person’s identity” (Palfrey & Gasser, 2016, p. 25). By sharing this information, youth have the ability to create an image of both how they see themselves and how they want others to view them (Williams & Merten, 2008). Part of young people’s decision to share information about themselves in digital spaces is tied to social norms around what researchers term “reciprocity of self-

disclosure” (Joinson, 2001). Within the online world, this construct refers to the expectation that one reciprocally exchanges information with others. Palfrey and Gasser (2016) suggest, however, that “the expectation that one ought to reciprocate when someone else shares personal information, for example, may lead a 16-year-old to share information about herself with little regard for risks” (p. 27). These risks range from the ways third parties may use information that youth knowingly (and unknowingly) share online to the impact the persistent nature of

online information may have on young people’s academic and professional futures (Palfrey & Gasser, 2016). Thus, within the context of the single area of identity exploration and formation, we envision that youth navigate a range of challenges and opportunities connected to other areas, such as forming and maintaining relationships, working through information quality issues, and managing their reputation and privacy, while staying safe and taking care of their well-being.

3. BEING MINDFUL OF CONTEXT

As we studied the selected frameworks addressing digital citizenship and other concepts (e.g., media literacy, 21st century skills), we observed that several of the initiatives presented areas of life in a hierarchical fashion. However, we chose not to order the areas provided in part III, section 2 into a particular hierarchy as we believe the perceived importance of each area depends upon one’s context. We recommend developing digital citizenship initiatives that remain mindful of young people’s context and how factors such as gender, age, ethnicity, race, sexual identity, physical ability, geography, religion, socioeconomic status, national origin, and educational attainment may affect their access to and use of digital technologies.³¹ For example, UNICEF (2017) estimates that around 29% of young people around the world, or 346 million individuals ages 15-24, do not have access to the Internet, with almost 90% of youth without access living in Africa, Asia, or the Pacific. On a global level, there is an Internet user gender gap of 17%, which is particularly marked in developing countries (International Telecommunication Union [ITU], 2019b). Additionally, in the least developed countries, only about 19% of the population is online, compared to almost 87% of individuals within developed countries (ITU, 2019b). Those from regions with large inequities in Internet access may then perceive digital access as one of the most integral areas of life related to online

engagement, compared to, for instance, content production or law.

With respect to national origin, studies exploring social media use among Indigenous youth in Australia, for example, reveal that social media can offer Indigenous youth opportunities to express their identity and connect with other members of the community, helping them to define, affirm, and strengthen their identity (Healy, 2013; Kral, 2010; Lumby, 2010). Social media accounts such as @IndigenousX on Twitter provide a space for Indigenous peoples to share their stories with others, with a different member from the Indigenous community tweeting each week from the account (Rice, Haynes, Royce, & Thompson, 2016). Nominated for a Shorty Award, which recognizes content creators on social media, @IndigenousX has been praised for “shar[ing] Indigenous knowledge and stories, challeng[ing] stereotypes, and reflect[ing] the diversity of Indigenous people” (Sweet, Pearson, & Dudgeon, 2013, p. 107). Scholars note that social media-based communities can help bring together and heal the Indigenous community (Rice et al., 2016) and that a well-formed cultural identity is associated with increased educational achievement (Dockery, 2013) and the prevention of self-harm among Indigenous youth (Dudgeon et al., 2012). Thus, in the case of young

³¹ For a more in-depth discussion of the potential impact that demographic factors — specifically, gender, race, and socioeconomic status — have on youth accessing, using, and developing skills around digital technologies, please see part VI, section 1.

people from Indigenous communities, certain areas of life, such as identity exploration and formation, may be particularly salient to their online engagement.³²

Against the backdrop of these contextual dimensions, we acknowledge that youth skill development can be impacted by youth's prior experiences and opportunities, as well as young people's access conditions, among other factors. We encourage individuals to consider the following questions to keep the importance of context in mind when creating initiatives that promote youth online engagement:

Does the young person in question have access to the Internet and digital technologies? If so,

- What primary digital tools and platforms does the person use (e.g., tools such as a desktop computer, laptop, or mobile device; platforms such as Twitter)?
- Who is using these technologies (e.g., individual vs. shared family device)?
- Where are the technologies being used (e.g., at school, at home, on the go)?
- What underlying purpose are these technologies being used for (e.g., learning, social life, entertainment)?

4. CHOOSING A MORE BALANCED APPROACH

As we mapped the different frameworks, we observed that the majority of explicitly included areas of life (see the visualization in part III, section 3) were clustered around areas traditionally associated with online risks and potential harms. These areas include safety and well-being, security, privacy and reputation and, to an extent, positive/respectful behavior. Areas connected to leveraging online opportunities appeared with less frequency but were still prevalent. For instance, more than half of the initiatives explicitly included the

areas of civic and political engagement, information quality, and content production. Less surprisingly, few frameworks explicitly included digital economy, data, and artificial intelligence. Thus, our review suggests that while digital citizenship initiatives are making efforts to balance the discourse around challenges and opportunities, there are still key areas that should be further addressed for youth to be able to acquire the skills to fully harness the opportunities the digital environment may offer.

5. INVOLVING YOUTH

Although the vast majority of the digital citizenship frameworks we mapped specifically focused on the youth population, few initiatives incorporated direct or indirect youth involvement³³ in the design, implementation, and curation process. As youth are the primary target population for many of these educational efforts, we recommend developing digital citizenship initiatives that are tailored to their diverse backgrounds, needs, and interests.

For example, the Good Play Project and Project New Media Literacies (2011) pilot tested their Our Space curriculum with students in formal and informal learning settings in different regions of the U.S. Based upon this testing, the projects further refined the format, framing, and substance of the curriculum. In another example of youth involvement, in the design of ISTE's Standards for Students, the organization solicited and incorporated feedback on the standards

³² Please note that this discussion around the perceived importance of areas of life in terms of context should not be interpreted as generalizations that apply to all members of the communities noted in this section.

³³ As noted in part III, section 1, we operationalized "youth involvement" as youth providing input in the curation of the framework through direct means (e.g., directly telling researchers what areas of life related to the digital environment are personally meaningful), or indirect means (e.g., participating and providing feedback on a pilot digital citizenship curriculum implemented in schools).

(drawn from individual surveys and comments on online forums) from more than 2,500 individuals – including “hundreds of students” (ISTE, 2016, p. 4).

At YaM, our own work around co-designing educational tools in collaboration with young people of diverse ethnicities, socioeconomic backgrounds, and educational levels has allowed us to incorporate youth perspectives and attitudes towards areas of life such as content production, civic and political engagement, identity exploration and formation, privacy and reputation, security, and artificial intelligence. From 2016 to 2017, for example, the YaM team partnered with several youth-serving organizations in the Boston area to co-design four curriculum playlists (i.e., a set of learning experiences in a specific sequence) with and for youth (Lombana-Bermudez, 2016). These playlists focused on areas such as law, civic and political engagement, the digital economy, and identity exploration and formation. Selected for their interest in digital technology and design, our youth collaborators engaged in a co-design process in which they identified the themes, goals, and potential audiences of each playlist before

prototyping and testing the playlist materials. Closely mapped to the phases of the design thinking process (i.e., empathize, define, ideate, prototype, and test) (Hasso Plattner Institute of Design at Stanford, n.d.), YaM’s co-design workshops enabled youth to become part of a participatory and collaborative environment where their knowledge, curiosity, and creativity were invited and valued. The inclusion of diverse youth in the co-design process resulted in the discovery of new playlist themes and activities (e.g., creating a playlist around job hunting based on feedback from youth). Involving young people in the co-design process also helped our team better understand how we can adjust the content and framing of our educational tools to be more mindful of different cultural contexts. While developing effective co-design sessions³⁴ can require great flexibility, time, and investment, the inclusion of youth in the development and deployment of digital citizenship initiatives can help ensure that the content is meaningful and engaging to young people (Gasser, 2019).

6. ASSESSING FRAMEWORK EFFICACY

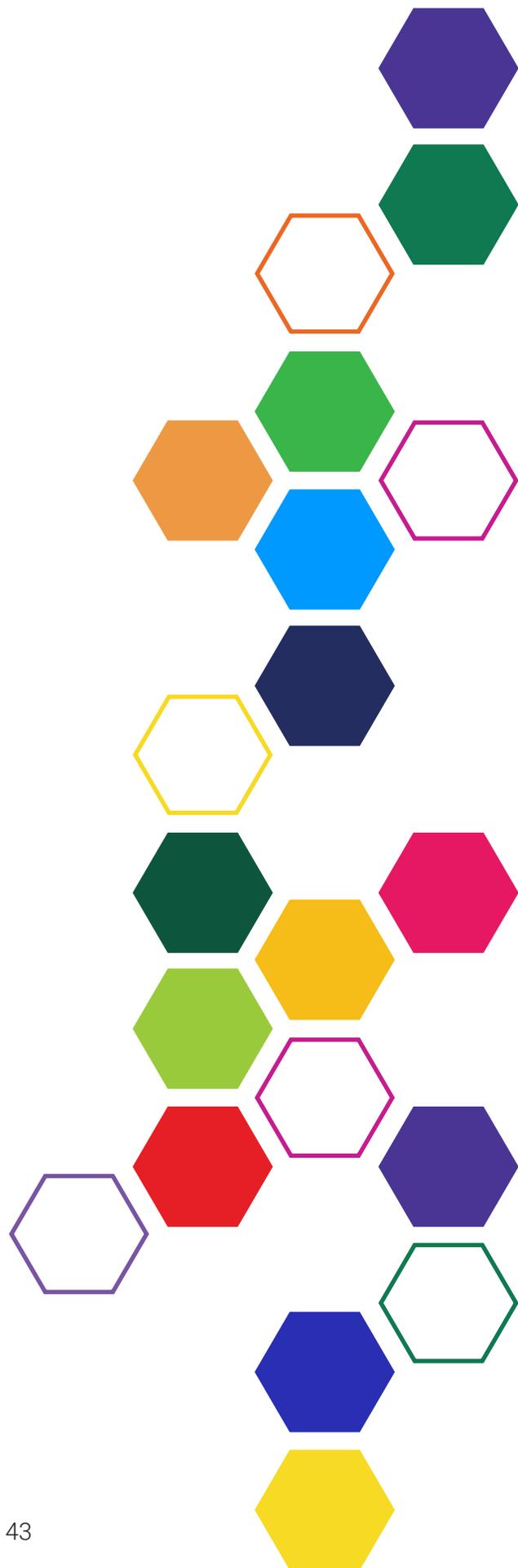
In order to better understand the effectiveness of initiatives around digital citizenship, and related concepts, it may be helpful to measure the skills youth are acquiring as they engage with the learning materials associated with these efforts. The DQ Institute, for example, recently assessed their DQ World program, an eight-week digital citizenship online learning program for youth ages 8 to 12 (DQ World, n.d.). By the end of the program, results from the survey, which collected data across 29 countries, demonstrated a 10% increase in youth’s overall “digital intelligence” (or “DQ”) score, as well as a 15% decrease in young people’s exposure to online risks (DQ Institute, 2018).

Although many stakeholders developed frameworks with accompanying materials designed to be implemented within formal or informal learning settings, we observed that few published data measuring the efficacy of these efforts. In the absence of such information, it is difficult to measure the effectiveness of these initiatives and whether youth are actually learning how to be digital citizens. How can stakeholders effectively measure the acquisition of skills associated with various areas of life and track skill development over time? Additionally, can frameworks be refined to improve the end goal of teaching youth how to be better digital citizens, and if so, in what ways? As the Broadband Commission for Sustainable Development (2017, p. 6) points out,

³⁴ For more suggestions around how to develop and engage in the co-design process with youth, please see Lombana-Bermudez (2016).

in the context of frameworks that address skills related to the digital environment, “enlarging the research and evidence base is essential to clarify best practices and build upon them.”

More broadly, Reich, Cortesi, Haduong, and Gasser (2014) suggest several useful approaches for obtaining evidence around indicators of an organization’s progress towards its goals. These three complementary strategies include 1) assessing program participation, 2) observing the program, and 3) gathering stakeholder reflections. In the context of digital citizenship initiatives, evaluation through program participation may include collecting metrics such as the number of young people engaging in the program and how often they participate in it (e.g., two workshops/classes per week over 10 weeks). Assessing an initiative through an observation of the program might encompass the evaluation of concrete outputs (e.g., videos that youth produce around civic and political engagement) by a rubric. Ideally, rubrics should include a set of categories that the product should address (e.g., integration of knowledge from multiple sources, critical analysis of sources), and benchmarks that indicate specific levels of proficiency for each category (Reich et al., 2014). Gathering stakeholder reflections may involve asking youth themselves – through surveys and/or interviews – about their experiences with the initiative. As Reich and colleagues (2014) point out, there is a vast array of methods to evaluate the success of a program; the approaches described in this part IV, section 6 represent just three potential ways of thinking about the evaluation process.



V. LOOKING AHEAD: UNDEREXPLORED AREAS

Based on the mapping of the frameworks, described in part III of this paper, we observed that the current digital citizenship conversation may benefit from increased dialogue around several areas of life that, thus far, seem to have received less attention within the frameworks we explored: data, computational thinking, artificial intelligence (AI), and the digital economy. In the majority of frameworks, these areas were rarely explicitly included.³⁵ In this part V, we provide a brief overview of how various formal and informal educational initiatives are addressing these first three areas.³⁶ We hope that this overview will help foster further dialogue among stakeholders in terms of ways these areas of life can be further incorporated into digital citizenship efforts.

Additionally, we believe it is important to frame the three areas of life described in this part V not only in terms of physical (e.g., knowing how to engage

with AI interfaces) and practical skills (e.g., understanding how to use an AI-powered voice assistant to look up information on Wikipedia) but also cognitive and meta-cognitive (e.g., visualizing data in creative and accessible ways) and social and emotional skills (e.g., using principles from computational thinking to advocate for social good). These types of skills become all the more important as these areas of life themselves may be perceived as predominantly technical; this perception may, in turn, diminish some youth communities' interest in exploring them. Additionally, as described in part IV, section 2, given the highly interconnected nature of areas of life, we feel it is helpful for educational initiatives to explore not only how data, computational thinking, and AI relate to each other, but how these areas connect to the larger digital ecosystem.

1. DATA

The area of life around data – which entails the technical ability and critical thinking skills needed to create, collect, represent, evaluate, interpret, and analyze data from digital and non-digital sources – is becoming increasingly important for youth in today's data-driven society. In the U.S., the Common Core standards in math, recently adopted by 42 states and Washington, D.C., include data analysis, probability, and statistics as mainstream strands in the kindergarten through 12th grade curriculum (Common Core State Standards Initiative [CCSSI], n.d.-a). According to the standards, young learners

begin to collect, represent, and interpret data starting in primary school (CCSSI, n.d.-b). From middle to high school, students are introduced to fundamental concepts in probability and statistics, coupled with real-world applications (CCSSI n.d.-c). Curricular kindergarten through 12th grade initiatives are also underway to introduce students to big data and data analytic tools, along with the skills needed to work with vast amounts of data (Touretzky, Gardner-McCune, Breazeal, Martin, & Seehorn, 2020). Beyond the U.S., math and science curricula that incorporate data in primary and secondary schools can be found

³⁵ In our visualization in part III, section 3, we denoted where it might be less clear if these areas of life are included, based on our framing.

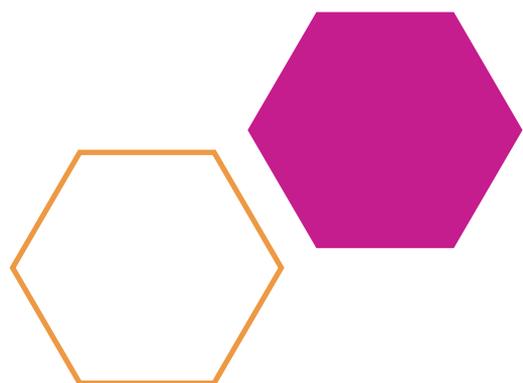
³⁶ To learn more about youth and the digital economy, please see YaM's forthcoming paper *Youth and the Digital Economy: Exploring Youth Practices, Motivations, Skills, Pathways, and Value Creation* by Lombana-Bermudez et al. (2020).

in countries such as Finland, Norway, New Zealand, and Thailand (Trends in International Mathematics and Science Study [TIMSS] & Progress in International Reading Literacy Study [PIRLS], 2015).

Scholars such as D'Ignazio (2017) note the importance of building inclusive pathways towards an understanding of and engagement with data that can promote not only learners' technical skill development but also their civic engagement. In addition to incorporating the perspectives of diverse professionals — including educators, designers, artists, community organizers, and civil servants — into data skill initiatives, introducing community-oriented data sets and supporting collaborative data-oriented activities can further cultivate creative data skills in and out of the classroom (D'Ignazio, 2017). Notable programs in data that incorporate the aforementioned principles include MAPSCorps (Meaningful, Active, Productive Science in Service to Communities) and Mobile City Science, in which high school students are trained as data scientists to help strengthen their local communities. In both programs, youth gather data about their community on smartphones with specific mobile-based applications and engage in data analysis to help translate findings to their community (MAPSCorps, n.d.; Mobile City Science, n.d.). MAPSCorps, for example, pairs high school and university students to collect and analyze data around community resources, in fields such as healthcare or employment, to make this information more accessible to community members (MAPSCorps, n.d.). One MAPSCorps project partnered with the organization NowPow to help health care providers prescribe self-care resources (e.g., smoking cessation workshops, or basic resources, such as food pantries) to their patients (Benefit Chicago, 2019). Another MAPSCorps project connected youth to the organization Voices of Youth Count to gather information about homeless young people in Chicago, which helped to inform

the organization's intervention efforts (MAPSCorps, n.d.). These and other efforts by MAPSCorps, and the similarly structured Mobile City Science, provide youth the opportunity to engage in data collection and scientific research using digital technologies while helping to promote career readiness and civic engagement (University of North Carolina Center for Health Equity Research, n.d.).

The digital world also offers rich informal learning opportunities around data. DataBasic, for instance, a project between the Engagement Lab at Emerson College and Massachusetts Institute of Technology's (MIT) Center for Civic Media, has developed a set of web-based tools that promote novel and relevant ways to work with data — in particular, textual data (DataBasic, n.d.-a). The tool ConnectTheDots, for instance, encourages users to generate textual data and then explore patterns in a multilayered network representation (DataBasic, n.d.-b), the type of which revolutionized Google searches (Engagement Lab, 2017). Using another tool, SameDiff, learners can explore quantitative text analysis by comparing text files to understand their similarities and differences (DataBasic, n.d.-c). DataBasic's tools also come with activities that can be implemented in formal or informal learning settings for those in middle school to higher education. SameDiff, for instance, features an activity that encourages learners to use the tool to compare the lyrics of two songs of their choosing and create a new song based upon this comparison (DataBasic, n.d.-d). Given that youth produce content that is not limited to numerical representation (e.g., memes and text-based posts), it may be helpful for future initiatives to continue to support the development of image and text analysis strategies.



2. COMPUTATIONAL THINKING

Just as the area of data provides a road map for young people to navigate today's data-rich world, competency in computer science — particularly computer programming — affords youth the opportunity to engage with rapidly emerging digital technologies. Israel was one of the first countries to introduce computer science as an academic subject in high schools, starting in the mid-1970s (Gal-Ezer & Stephenson, 2014). More recently, 18 European countries — including Bulgaria, Estonia, Greece, Italy, Portugal, Slovakia, and Spain — and other countries around the world, such as Australia and Japan, have been working on integrating computer science as part of the kindergarten through 12th grade curriculum (Touretzky, Gardner-McCune, Martin, & Seehorn, 2019). In the U.S., the 2016-2017 school year saw an increase in the number of high schools offering computer science, with 40% of schools teaching a class where students can learn coding or computer programming (Google Inc. & Gallup Inc., 2016). To encourage programming in the classroom, the organization Code.org has developed free online courses in computer science for teachers, along with an array of computer science courses suitable for the kindergarten through 12th grade curriculum (Code.org, 2019b). Additionally, the organization's Hour of Code initiative consists of one-hour online tutorials in coding for students of all ages (Code.org, n.d.). These tutorials have been translated into more than 45 languages and have reached millions of students in more than 180 countries (Hour of Code, 2020).

Whether coding computer programs with C++, Java, or Python, one of the most important aspects of computer programming is the development of computational thinking. Placing programming in the context of a collaborative online community, Brennan and Resnick (2012) define computational thinking along three main dimensions: computational concepts (e.g., sequences, iterations, and conditionals); computational practices (e.g., debugging, abstracting and modularizing, reusing and

remixing); and computational perspectives (e.g., self-expression, collaboration). This conceptualization of computational thinking is based on the study of how young people learn to program and create interactive designs using Scratch. Developed at the MIT Media Lab, Scratch is an online programming environment that enables young people (geared towards ages 8-16) to create their own interactive stories, games, and simulations, and share these creations in an online community with other young programmers from around the world (Maloney, Resnick, Rusk, Silverman, & Eastmond, 2010). Three design principles have guided Scratch: an interface that 1) encourages youth to tinker with programming blocks, testing different combinations to see the result, 2) promotes meaningful learning by supporting a wide variety of projects (e.g., videos, simulations, games) and 3) fosters a social, collaborative environment³⁷ by, for instance, allowing users to share their work with others on the platform; build upon others' work, remixing it; exchange knowledge in discussion forums; and create projects together (e.g., animations, games, etc.) (Resnick et al., 2009). With an online community of over 50 million users (Scratch, 2019) in more than 150 countries, Scratch has been translated into over 40 languages and is found in an array of settings, including homes, schools, libraries, and community centers (Scratch, n.d.).

Scratch's Community Blocks enables young people to actively reflect on data that they generate online, as they use programming to access, analyze, and visualize the data they create while participating in Scratch (Dasgupta & Hill, 2017). This platform helps shift the paradigm of adult data scientists analyzing the data that youth share online knowingly (e.g., using social media platforms, posting photos) and unknowingly (e.g., likes and shares, online shopping, using mobile apps, sensors, and trackers) to youth actively analyzing their own generated data.

³⁷ To learn more about collaboration within the Scratch community, please see Lombana-Bermudez et al. (2020), which presents a case study of virtual collaboration on Scratch.

3. ARTIFICIAL INTELLIGENCE

Related to the areas of data and computational thinking is the ability to understand AI systems. With the advent of big data and rapid increases in computing power, AI-based technologies are reshaping a wide range of sectors of the economy and impacting domains ranging from health and well-being to the future of work, and creativity and entertainment (Brossi, Dodds, & Passeron, 2019; Hasse, Cortesi, Lombana-Bermudez, & Gasser, 2019a; UC Berkeley Human Rights Center Research Team, 2019; UNESCO, 2019a; UNESCO, 2019b; UNICEF, 2019a; UNICEF, 2019b; World Economic Forum, 2019). As many of today's youth encounter and interact with AI-powered technologies, such as Netflix's recommendation system or Google's suggested search queries, it may be helpful to think about how we want to prepare today's youth for AI's current and future impact on their lives.

Here is one young girl's inspiring story, as covered by popular media outlets in the U.S. When New Yorker Emma Yang was 7 years old, her grandmother, who lived thousands of miles away from her in Hong Kong, started to become more and more forgetful (Peters, 2018). As her grandmother's memory deteriorated due to early-onset Alzheimer's, Emma decided to intervene. Emma, who learned to code at a young age, started developing a mobile application, Timeless, that uses AI-based technologies to help her grandmother and others with Alzheimer's recognize their loved ones, remember events, and stay connected and engaged with those around them. To develop an app that relies on identifying faces in photos, Emma, who is now 15, turned to online tutorials on machine learning and AI, consulted specialists in Alzheimer's, and connected with an AI facial recognition platform start-up.

How do we inspire and support youth around the globe, who, like Emma, want to create change in the world around them, and are interested in utilizing AI-based technologies to do so? Educational initiatives, whether in formal or informal learning spaces, may want to introduce students, starting in primary school, to the fundamental concepts, methods, and

issues associated with AI, such as machine learning and algorithms. In the formal educational setting, AI might be incorporated in subjects such as computer science and math. In math, for instance, at the primary school level through data analysis (e.g., collecting and representing data and recognizing patterns in it) and in middle school and high school through statistics, probability, and calculus. At the university level, initiatives such as Harvard University's Embedded EthiCS program seeks to bring ethical reasoning into the university's computer science courses (Grosz et al., 2019). For example, in a machine learning course, an Embedded EthiCS module encourages students to consider the various ways machine learning systems can exhibit discrimination and how discriminatory impact can be prevented. As Grosz and colleagues (2019) explain, through the program, "Students can learn to think not only about what technology they could create, but also whether they *should* create that technology" (p. 56).

Outside of the classroom, various educational initiatives aim to teach youth about AI through project-based learning and the application of concepts to real-world issues. MIT's Beaver Works Summer Institute (BWSI), for example, consists of a STEM-focused online course and summer program for rising high school seniors (MIT BWSI, 2019). BWSI's four-week summer program promotes STEM skill development in a creative environment where youth have the opportunity to work in teams to learn about and build AI-based technologies. BWSI's most recent summer program featured a variety of courses, including Cog*Works, where young people worked together to create an autonomous cognitive assistant while learning data analysis, math, and programming skills (MIT BWSI, 2019). In another course, Medlytics, youth learned about and applied an understanding of the intersection of data science, health, and medicine by developing a health application prototype in teams. The course, enriched by visits from Boston-based clinicians and academics, exposed young people to innovations in the fields of health and machine learning and provided

insight into concerns associated with health data. MIT's BWSI (2019) thus provides a learning setting where youth have the opportunity to cultivate social skills, such as collaboration, in addition to building a strong understanding of fundamental AI concepts applied to real-world issues while considering ethical concerns around AI systems.

Ethical Conversations

As the formal and informal educational initiatives around AI described in this part V, section 3 illustrate, it may be helpful for educational interventions to emphasize both the physical and practical skills youth may need to be able to engage with AI, as well as the ethical conversations (connected to cognitive and meta-cognitive, and social and emotional skills) around the development and deployment of AI-based technologies. As one example, MIT's Moral Machine experiment (Awad et al., 2018), the largest study to date of machine ethics, highlights the importance of taking into account various cultural and regional differences when considering how individuals might respond to ethical concerns related to AI. The study surveyed over two million individuals across 233 countries and territories about how they would want self-driving cars to respond to moral dilemmas arising from unpreventable autonomous vehicle accident scenarios involving humans and/or animals. The authors found that many of the moral guidelines that may shape drivers' decisions vary based on country. For instance, some countries exhibited a preference for safeguarding the lives of older versus younger people, or individuals from a specific socioeconomic class over other classes.

Ethical variations across cultures and countries highlight the complexity of moral dilemmas and decision-making in the context of AI. Given the opportunity digital technologies afford to interact with others from around the world, it might be useful for youth to not only aim to understand and engage with cultural, social, and regional nuances on an individual level but also strive to do so in ways that take into account the impact their actions may

have on the wider online community. James (2014) terms this latter mode of thinking "ethical thinking," which entails "considering the effect of one's actions on multiple and distant stakeholders and on the integrity of a larger community" (p. 4). When youth, for instance, share online how they think about and engage with various AI-based technologies – whether that might be AI-powered voice assistants or mental health chatbots – it may be useful for them to consider how different individuals, groups, communities, and geographies relate to AI.

In light of the importance of context, it may also be useful for young people to recognize that while AI systems can have impacts on a global scale, the relatively small group of companies leading the development of AI-powered technologies typically have little insight from a variety of disciplines, cultures, and socioeconomic classes (Ashar & Cortesi, 2018), underscoring the importance of including underrepresented groups in the design and deployment of AI (Frey, Patton, Gaskell, & McGregor, 2020). Against this backdrop, there is a growing gap between those who have access to information about AI systems and understand their impact and those who do not (Ashar & Cortesi, 2018). As young people engage in conversation around AI-based technologies online, it may be helpful for youth to keep in mind that not all others they interact with in the digital world may have the same level of understanding and engagement with AI.

This very brief overview of the ethical considerations surrounding AI-based technologies³⁸ demonstrates the complexity of the ways individuals understand and engage with AI systems. It may be helpful for initiatives around digital citizenship and related concepts to discuss AI – as well as all 17 areas, and particularly those with a traditionally technical orientation (e.g., computational thinking, data, security) – in the context of the impact these technologies may have on society, including ethical questions and concerns surrounding them.

³⁸ Please see Fjeld, Achten, Hilligoss, Nagy, and Srikumar (2020) to learn more about ethical and human-rights based frameworks designed to provide direction around the development and use of AI systems.

VI. SUPPLEMENTARY MATERIALS



In this part VI, section 1, we discuss how the opportunities youth have to access digital technologies and meaningfully participate online can differ based on various demographic factors. Although more young people around the world are connecting to the Internet due to increased access to mobile devices and computers in school and at home, disparities in participation persist for youth across factors such as gender, race and ethnicity, and socioeconomic status. In addition to these demographics, other contextual factors of relevance, such as age, national origin, location, and skill and education level, can further impact youth access and engagement with digital tools, resulting in unequal exposure to opportunities that may promote skill development.

As one example, youth from diverse backgrounds have differing access to robust learning experiences involving digital technologies within educational

environments, which can affect their successful completion of STEM courses of study and their preparation for STEM-related careers. As this part VI, section 2 expands upon, initiatives around the world are working to bring more underrepresented groups – including women and girls – into STEM fields like computer science by, for instance, creating a strong support network in the field and encouraging youth to apply computer science concepts towards societal issues (e.g., environmental conservation, bias in the criminal justice system). Despite this progress, understanding how disparities in participation for youth from different communities continue to evolve in local, regional, and global contexts is critical for designing educational and policy interventions that promote digital equity and foster the skills youth need to thrive in our digital world.

1. DEMOGRAPHIC FACTORS AND DIFFERING EXPERIENCES

Gender

The presence of gender differences in the context of digital technologies becomes apparent when examining the access girls and women around the world have to digital tools, the quality of their online experiences, the skills they develop, and the education and career pathways they select and pursue. Despite the limited availability of data on these aspects of gender differences worldwide – especially data from countries in the Global South, data from youth, and data that is both longitudinal and internationally comparable – recent studies do reveal a gender gap in the usage of mobile phones, computers, and the Internet in the majority of countries with reportable

data (Sey & Hafkin, 2019). The ITU estimates that, on a global level, 48% of women are using the Internet, versus 58% of men (ITU, 2019b). From 2013 to 2019, the gender gap has decreased in certain regions of the world, including Europe and the Commonwealth of Independent States, but widened in Africa, the Arab States, and Asia and the Pacific (ITU, 2019b). Large country- and region-level differences, however, do exist. Countries such as Jamaica, Mongolia, and Panama, for example, have higher rates of women using the Internet (ITU, 2019a). In the U.S., teenage girls are more likely than teenage boys to use the Internet “almost constantly” (Anderson & Jiang, 2018, p. 8).

Contrasting trends in access and basic use such as these reveal that identifying gender inequalities through these measures alone is insufficient, as gaining access to the Internet or digital technologies does not eliminate the inequalities girls and women face when online. Differences in the quality of the online experiences individuals of different genders have reveal a more nuanced understanding of gender inequalities for digital technology users. In the U.S., for example, a 2018 Pew report found that teenage boys and girls have equal access to desktop and laptop computers, with girls having slightly higher rates of access to smartphones than boys (Anderson & Jiang, 2018). These equivalent rates of access, however, belie differences in boys' and girls' experiences of cyberbullying³⁹ or online harassment. Teenage girls in the U.S., for example, are more likely than their male counterparts to experience more than one form of online bullying, with 15% of girls surveyed having experienced four or more types (Anderson, 2018). Additional studies in the U.S., and beyond, have echoed the finding of higher victimization rates among females⁴⁰ (e.g., Heiman & Olenik-Shemesh, 2015; Kim, Kimber, Boyle, & Georgiades, 2019; Låftman, Modin, & Östberg, 2013; Schultze-Krumbholz et al., 2015; Tarabulus et al., 2015; Walrave & Heirman, 2011). Other studies note gender disparities among young adults engaging in more active online behaviors, such as content production. For example, Hargittai and Shaw (2015) found that lower levels of Internet skills⁴¹ in young women in their early 20s compared to young men in the same age group could help explain the lower rates of female users contributing to authorship on Wikipedia. Corroborating this skills gap, the ITU (2018) found that adult women in 31 countries around the world had lower levels of basic digital skills, such as sending emails with attached files and

transferring files between a computer and another device, compared to adult men. Data from the same report showed that the percentage of men worldwide who have advanced digital skills, such as being able to write a computer program, is twice that of women (ITU, 2018).

Lower skill levels and rates of active participation, coupled with being victimized online, can diminish the quality of the experiences girls and women have online and can hinder their ability to engage in positive and meaningful behaviors online in the future. Such inequities are further compounded by trends in formal education, which reveal gender differences in STEM subject enrollment and completion that impact female students' skill development and female workers' professional development. (Sey & Hafkin, 2019). Looking at the primary and secondary school level on a global scale, as math and science classes are often part of the national curriculum for many students, exposure to these subjects tends to be similar at such grade levels (Sey & Hafkin, 2019). Gender differences start to emerge globally at the secondary school level when students begin selecting more of their own academic coursework (Spearman & Watt, 2013; UNESCO, 2017). For example, female students accounted for only 29% of all students taking AP computer science exams⁴² in 2019 (Code.org, 2019a). At the university level, female students comprise a mere 36% of students majoring in STEM-related domains around the world (Sey & Hafkin, 2019). Negative stereotyped perceptions of who pursues technical careers and a lack of confidence in girls play a large role in discouraging girls and young women from the pursuit and exploration of computer science and other STEM-related activities (Hur, Andrzejewski, & Marghitu, 2017). Scholars have also observed a paradoxical trend, noting that "countries with high

³⁹ To learn more about the prevalence of online bullying in and beyond the U.S., as well as practical, impactful guidance on preventing and responding to cyberbullying, please see Hasse, Cortesi, Lombana-Bermudez, and Gasser (2019b).

⁴⁰ Other studies in and outside of the U.S., however, suggest that boys are more likely to be cyberbullied than girls (e.g., Fanti, Demetrious, & Hawa, 2012; IPSOS Ltd Ghana, 2017; Marret & Choo, 2017; Sittichai & Smith, 2018). While other research in the U.S. and beyond has found no gender differences in terms of cyberbullying victimization (e.g., Griesel, Finger, Bodkin-Andrews, Craven, & Yeung, 2012; Kowalski & Limber, 2013; Lazuras, Barkoukis, Ourda, & Tsorbatzoudis, 2013; Mura & Diamantini, 2013; Navarro, Ruiz-Oliva, Larrañaga, & Yubero, 2015; Shin & Ahn, 2015).

⁴¹ Hargittai and Shaw (2015) define Internet skills as "the ability to use the Internet effectively and efficiently" (p. 427). For more comprehensive information around these skills, please see Hargittai and Shaw (2015).

⁴² There are currently two AP exams available for high school-level students studying computer science: AP Computer Science and AP Computer Science Principles (College Board, 2018).

levels of gender equality have some of the largest STEM gaps in secondary and tertiary education” (Stoet & Geary, 2018, p. 581). Stoet and Geary (2018) note that one possible explanation could be that in such countries, when boys are relatively better in math and science while girls are relatively better at reading, versus other academic subjects, students tend to be advised to pursue academic paths according to those strengths. In less gender-equal countries, a STEM pathway that pays well may appear to be an investment in a more secure future and thus pursued by students across genders.

The gender gap continues to manifest once students are part of the adult workforce. In the U.S., for example, a 2018 Brookings Institute report mentions a decrease in recent years of female representation in highly digital occupations such as computer programming and information systems management (Muro, Liu, & Whiton, 2018). In newer fields, such as AI, studies have also found a gender gap; for example, only 18% of researchers publishing in 21 leading AI conferences identify as female (Element AI, 2019). There are also gender differences in the occupations and skills AI professionals around the world are likely to hold. The World Economic Forum’s *Global Gender Gap Report 2018* found that women are more likely than men to work as data analysts, librarians, and teachers, whereas men are more likely to hold more senior positions such as head of engineering, head of Information Technology, and CEO (World Economic Forum, 2018). In addition to the AI industry, entrenched gender gaps exist in STEM-adjacent fields such as technology entrepreneurship and policy (Sey & Hafkin, 2019), revealing the critical importance of initiatives that support the inclusion and advancement of women in roles related to the development of innovative technologies. Others also call for initiatives that present gender equality in non-binary (male/female) terms, in order to promote the inclusion of transgender and other intersectional identities. To learn more about the gender gap in the field of computer science, as well as several

initiatives around the world that promote the interest, inclusion, and mentorship of girls and young women in this domain, please see this part VI, section 2.

Socioeconomic and Racial Factors

Looking at socioeconomic and racial demographics, differences emerge both across and within countries in regard to individuals’ access to digital technologies, high-quality online experiences, and opportunities for skill development. As with data on gender differences, most sources of data come from high-income countries, with fewer sources available, especially for youth, in low- to middle-income countries. The limited availability of country, regional, and global data from around the world complicates the ability to make international and longitudinal comparisons for demographic factors such as socioeconomic status, race, and ethnicity. As noted in part IV, section 3, UNICEF (2017) estimates that around 29% of young people around the world, or 346 million individuals ages 15-24, do not have access to the Internet. Nearly 90% of youth without access live in Asia, Africa, or the Pacific. Barriers such as poor infrastructure and high data costs create large disparities in access for youth: around 60% of youth in Africa are not online, compared to only 4% of youth in Europe (UNICEF, 2017). Country-level data from low-income countries also reveal limitations in Internet connectivity. In Bangladesh and Zimbabwe, for instance, less than 5% of children and young people under the age of 15 use the Internet (UNICEF, 2017). Among those young people who have access to digital technologies,⁴³ significant differences may exist across countries and in terms of which device they use to access the digital environment (UNICEF Office of Research–Innocenti, 2019).

Recent data from higher-income countries, especially those with rich sources of data across racial or socioeconomic demographics, reveal a complex landscape in which youth from low-income backgrounds (Paus-Hasebrink, Kulterer, & Sinner,

⁴³ For a visual representation of the percentage of children (ages 9-17) who use a desktop computer or mobile phone to access the Internet at least weekly, by country (including Albania, Argentina, Brazil, Bulgaria, Chile, Italy, Ghana, Montenegro, the Philippines, South Africa, and Uruguay), please see pages 10-11 of UNICEF Office of Research–Innocenti (2019).

2019) and youth of color encounter differences in the quality of their online experiences, even if they have basic access to digital technologies (Watkins et al., 2018). In the U.S., for example, teens have almost universal access to smartphones, regardless of their race, ethnicity, or socioeconomic background (Anderson & Jiang, 2018). Hispanic teens (82%) are less likely than white teens (90%) to report access to a computer at home, and only 75% of lower-income teens report access, compared to 96% of higher-income teens (Anderson & Jiang, 2018). A 2015 Common Sense study found higher rates of daily smartphone use among Black, Hispanic, and lower-income teens in the U.S. compared to white, middle-income, and higher-income teens, suggesting that youth from the former backgrounds may have greater smartphone dependence due to their decreased access to other devices, such as personal computers (Rideout, 2015). This smartphone dependence can already be seen in the numbers of Hispanic, Black, and low-income adults in the U.S. (Pew Research Center, 2019) as well as individuals living in low- to middle-income countries who — lacking high-speed broadband service at home — primarily rely on their mobile devices to connect to the Internet (UNICEF, 2017).

Although smartphones are undeniably powerful tools that can, with a data plan, provide greater Internet access and online participation, youth who rely primarily on the constraints of smaller, mobile screens can have a lower quality online experience that limits their opportunity to engage in more active, skill-building activities, from programming and robotics to media production and design, that computers can more easily support. Scholars such as Watkins et al. (2018) thus point to a mobile paradox whereby Black and Latino youth in countries such as the U.S. are seen as “mobile trendsetters” and “early adopters” of the mobile Internet, but, in lacking equal access to home broadband service, face larger barriers in terms of accessing a broad range of social and educational opportunities that “promote digital exploration, experimentation, and content creation” (Watkins et al., 2018, p. 58). Research from outside the U.S. also reveals a “reverse gap” in which students

from lower-income families spend more time online than their wealthier counterparts but are less likely to engage in active behaviors such as “reading news or obtaining practical information from the Internet” (OECD, 2015, p. 135; Valdivia, Brossi, Cabalin, & Pinto, 2019). Therefore, differences in young people’s access to a range of Internet services, devices, and activities at home can further impact their ability to develop relevant skills and fully participate in rich experiences using digital tools.

In light of the barriers that youth of different socioeconomic, ethnic, and racial backgrounds face at home, school can play a critical role in providing opportunities for quality online experiences. In fact, many low-income youth around the world can only access a computer or the Internet while at school. The OECD (2015) reported that over 30% of the lowest-income students in countries such as Costa Rica, Mexico, and Turkey are particularly reliant on school access because they do not have computers or Internet connectivity at home (OECD, 2015). In efforts to provide digital opportunities to youth from low-income backgrounds, countries such as Japan, Portugal, and Tunisia have maintained lower student-to-computer ratios in schools serving students from this demographic compared to schools serving higher-income populations (OECD, 2015). Equal, or even greater, access to devices at school, however, does not necessarily translate into equitable opportunities for skill development. Van Deursen (2010) notes that individuals who are primarily relegated to Internet use at school have limited time to engage with the digital environment, which can hinder their skill development and their opportunity to acquire forms of social, economic, or cultural capital in the future. Students with computer access at school but only smartphone access at home may experience a persistent homework gap, in which they are expected to use the Internet to complete school assignments but are unable to do so with the same level of ease or quality as their higher-income counterparts (Watkins et al., 2018). This gap is particularly seen in high- and middle-income countries (UNICEF, 2017). In the U.S., for instance, Common Sense’s recent nationally representative

survey of youth and digital media reveals that teenagers in higher-income households spend more time using computers to complete their homework, while young people from lower-income households spend more time using their smartphones for homework⁴⁴ (Rideout & Robb, 2019).

Research from over 60 countries around the world also indicates that a lack of effective classroom teaching can impede students' ability to reap the benefits of using digital technologies in schools (OECD, 2015). The crucial need for strong pedagogy can be seen in countries such as the U.S., where low-income, Black, and Latino youth have similar rates of Internet and computer access at school compared to their higher-income and white counterparts but are more likely to learn under "curriculum-poor conditions," with less experienced teachers, smaller budgets for educational resources, fewer creative or collaborative activities using digital tools, and limited instruction in topics like computer science (Watkins et al., 2018, p. 114). These differences in exposure to high-quality learning experiences contribute to the low rates of Black and Latino youth taking AP computer science exams: in 2018, only 5% of test takers identified as Black or African-American, while around 15% identified as Hispanic or Latino (College Board, 2018). Compared to their non-AP counterparts, students who take AP Computer Science exams are twice as likely to take computer science-related courses in college and six times more likely to major in computer science, with Black and Latino AP students having even higher rates of majoring in the field (Morgan & Klaric, 2007). Thus, while access to robust STEM learning opportunities, especially coupled with well-trained educators, has the potential to impact youth academic interests and promote continued skill development in the future, lower-quality STEM education has cumulative effects that can negatively impact students throughout their early and later schooling. For instance, Black, Latino, and Native American college students in the U.S. aspire to major in STEM fields at virtually identical rates compared to their white counterparts but are significantly less likely to graduate with bachelor's degrees in STEM subjects (Higher Education Research Institute,

2010), potentially revealing a "lack [of] access to the educational preparation necessary to realize their desire to earn degrees in STEM" (Watkins et al., 2018, pp. 128-129). Students from lower-income high schools in the U.S. are also less than half as likely to earn STEM undergraduate degrees compared to students from higher-income high schools (National Student Clearinghouse Research Center, 2016).

Differences in skill development and educational preparation can hinder the ability of individuals from diverse countries, racial and ethnic backgrounds, and income levels to compete in a global workforce.

The World Bank (2016) reported that 40% of urban workers in Vietnam, 30% in Bolivia, and over 15% in Kenya found that a lack of ICT skills can impede wage growth and employment. Higher-income individuals around the world are more likely to have the relevant access and skills to conduct online job searches, for example, with less than 5% of urban workers in countries such as Vietnam, Bolivia, and Ghana using online tools to search for jobs (World Bank, 2016). In terms of the global ICT sector, competition is high to enter the field: while ICT professionals in low- and middle-income countries earn wages that are 1.5 times higher than their counterparts in other fields, they are also twice as likely to have completed postsecondary education compared to non-ICT professionals (World Bank, 2016).

When examining racial and ethnic differences in STEM employment within individual countries, data from countries such as the U.S. reveal large discrepancies. Although Black and Hispanic professionals make up, respectively, 11% and 16% of the total U.S. workforce, 9% of the STEM workforce is Black, while only 7% is Hispanic (Funk & Parker, 2018). Among software developers, for instance, 5% identify as Black, and only 4% identify as Hispanic (Landivar, 2013). STEM professionals also experience discrepancies in pay. Black, Hispanic, and Native American science and engineering graduates earn, on average, around \$13,400 less per year compared to their white counterparts (Landivar, 2013). The underrepresentation of racial and ethnic minorities in managerial or leadership positions could

⁴⁴ Teens from higher-income homes spend about 55 minutes/day using a computer for their homework, while youth from lower-income homes spend 33 minutes/day. And teens from lower-income households spend approximately 21 minutes/day using their smartphone to complete their homework, while young people from higher-income homes spend 12 minutes/day (Rideout & Robb, 2019).

play a contributing role in these salary differences. Within industry positions, less than 6% of engineering managers identify as Black, while less than 7% identify as Hispanic or Latino (National Science Foundation, 2017). Black (40%), Hispanic (19%), and Asian-American (31%) STEM professionals in the U.S. are significantly more likely than their white counterparts (5%) to report that their race or ethnicity has posed barriers to their professional success, citing reasons such as negative treatment from coworkers (Funk & Parker, 2018). When asked about diversifying STEM

fields, professionals from racial and ethnic minority backgrounds emphasize the need for quality STEM education beginning in the elementary school years, as well as strong mentors and role models who can inspire and support students and young professionals (Funk & Parker, 2018). Others mention the importance of creating educational and workplace initiatives that promote the inclusion and advancement of girls and young women of color, racial or ethnic minority youth from low-income backgrounds, and those with other intersectional identities (Funk & Parker, 2018).

2. A CASE STUDY: ADDRESSING THE GENDER GAP IN COMPUTER SCIENCE

In the U.S. alone, it is projected that computer science-related occupations (e.g., computer programmers, software developers, computer network architects) will increase over a ten-year span by 12% — by 2028, adding approximately 546,200 new jobs to the labor market (U.S. Bureau of Labor Statistics, 2019). Against this backdrop, it may be useful for efforts within formal and informal learning settings to help youth develop the knowledge and skills necessary for careers in computer science, data science, and related fields. In conjunction with 100 experts, the Oceans of Data Institute (2014), for example, produced an occupational profile of a big-data specialist, describing the roles and responsibilities careers in big data could entail, as well as the skills, knowledge, and behavior needed for positions in an increasingly data-driven economy. Initiatives in this arena may serve as a guide for educators in designing curricula and programs to help prepare youth for the workplace of tomorrow.

In developing these programs, it is important to address disparities in gender, racial, and socioeconomic representation. When examining gender disparities in computer science, for example, a global survey of women in the field demonstrates a decline in female computer science graduates since 2000, which is especially pronounced in high-income countries (Huyer, 2015). From 2000 to 2012, the number of women graduates in computer science has decreased in countries such as the U.S., New

Zealand, and Australia (Huyer, 2015). In the U.S., for example, only 18% of women obtain a bachelor's degree in computer science (National Center for Education Statistics, 2016). In other regions of the world, such as the Caribbean and Latin America, the proportion of female graduates in computer science has fallen between 2 and 13 percentage points from 2000 to 2012 (Huyer, 2015).

While, on a global scale, the percentage of women obtaining computer science degrees and entering the workforce in the field is low, when one looks outside of the Western world, there is a growing body of literature offering a more diversified landscape (Kelkar, Shrestha, & Veena, 2005; Ng & Mitter, 2005; Saloma-Akpedonu, 2005; Wajcman & Lobb, 2007). In Malaysia, for example, the percentage of women completing education and securing positions in software and computer science departments is equivalent to the percentage of men (Mellström, 2009). The large proportion of women in the field primarily stems from several historical factors, including the race-based quota system for university admission in Malaysia and the predominance of women in the Malay electronics industry, the precursor to the information technology industry. Per the former, up until 2005, those students who entered state universities were divided into “bumiputeras” — or “sons of the soil,” meaning they are Malaya or from a Malay-related group — and non-bumiputeras. The university quota system guaranteed that at least

half of all students were “bumiputeras.” Mellström (2009) points out that this system has helped open opportunities for Malay women to study computer science as they were “favoured on the grounds of the race ‘positive’ policy,” which “granted students places that possibly would not have been open without the quota system” (p. 893). In terms of the latter, export-fueled industries such as electronics and garments became increasingly popular as Malaysia ushered in a global economic market in the 1970s; women soon flocked to these job opportunities, partially due to their perceived dexterity (Levidow, 1996; Lie & Lund, 1994; Ong, 1987). The large-scale recruitment of women into the electronics industry opened up a new field for women and made this field “symbolically associated with femininity” (Mellström, 2009, p. 896).

In areas of the Western world, such as the U.S., what are some of the driving social and cultural forces that contributed to the gender gap in computer science? Interestingly, women represented a major presence during the early decades of computing. Ada Lovelace, viewed as the first computer programmer, was a trailblazer in the field who conducted much of her work during the 1840s (Corbett & Hill, 2015). During World War II, the majority of computer programmers were women, such as Grace Hopper, who developed the notion of a “compiler,” which generated a process for converting code into a language that a variety of machines could understand (Chang, 2018). Around the mid-1900s, computing represented an emerging field without a gender identity, attracting both men and women (Abbate, 2012; Ensmenger, 2010; Koput & Gutek, 2010). However, as Koput and Gutek (2010) point out, “Over a . . . short period of time, a field that was once relatively gender integrated has become solidly male dominated” (p. 103).

Researchers and historians note a variety of explanations for this shift. Computing historian Nathan Ensmenger (2010) points out, for instance, that in the 1960s and 1970s, companies recruiting computer programmers adopted aptitude and personality tests that favored male-stereotyped characteristics. The widely-used Cannon-Perry test – based on a sample of 1,378 programmers, only 186 of whom were women – concluded that

“programmers [share] one striking characteristic: they ‘don’t like people’” (Chang, 2018). Ensmenger (2010) elaborates by describing how the “industry selected for antisocial, mathematically inclined males, and therefore, antisocial, mathematically inclined males were overrepresented in the programmer population” (p. 78). These hiring practices, in turn, “reinforced the popular perception that programmers ought to be antisocial and mathematically inclined (and . . . male)” (p. 78), despite little empirical evidence that men who are antisocial are more skilled in math or computing, and no evidence that men are inherently more adept in math than women (Chang, 2018).

Several researchers attribute the rise of the personal computer in the 1980s as another force behind the computer industry’s shift in gender representation. In 1981, IBM released the personal computer, and Apple launched the Macintosh in 1984. As Corbett and Hill (2015) explain, “Before that, few people’s homes or businesses had computers, and girls and boys had similar exposure to computers – generally none” (p. 16). As computers entered the home, however, they were quickly adopted by boys and men as a new type of toy (Margolis & Fischer, 2002). Haddon (1992) notes that the personal computer tied the computing industry more broadly to game-playing domains (e.g., arcades), which were largely the arena of boys and men. In the U.S., enrollment in university computer science courses surged with the rapid rise of computers (Chang, 2018). As schools struggled to hire enough faculty to meet the growing demand, they began imposing strict, grade-based requirements for admission into and completion of undergraduate computing programs. Armbrecht (2015) elaborates on the implications of such stipulations:

The result was that by the time young men arrived at university, they had already been exposed to computers and computer programming, while women were often starting from scratch. The uneven playing field left many women discouraged. Female enrollment rates in computer science programmes plummeted. At its 1984 peak, 37% of computer programmers were women. By 2011, it was only 12% (para 10).

Moving forward, how do stakeholders such as policymakers, NGOs, and educators help close the computer science gender gap? Initiatives within formal and informal learning spaces are helping to shape a more equitable future. For example, Harvey Mudd College, a science and engineering school in Southern California, has helped to spearhead a more inclusive computer science community for students (Nickelsburg, 2019). To help counter the stereotype of an “isolated, antisocial” computer programmer, Harvey Mudd redesigned introductory computer science courses to focus more on collaborative problem solving, versus solely programming (Sydell, 2017). To assist students with no prior coding background who are, as Harvey Mudd President Maria Klawe points out, “disproportionately women” (Klawe, 2013, para. 9), the school divided introductory classes into two sections: one for students with no prior computer science experience and one for those with a background in this domain. Klawe explains that having two sections helped remove the “intimidation that comes from being in a class where you’ve had no prior experience and somebody else has been programming since they were eight” (Sydell, 2017, para. 7).

Harvey Mudd also helps to connect female students to the broader computer science community; each year, the school sends 40 to 60 students to the Grace Hopper Celebration of Women in Computing, the world’s largest conference for women in technology (DeNisco Rayome, 2016). Over the course of a decade, from 2006 to 2016, the percentage of women computer science majors at Harvey Mudd increased from 15% to 55% (DeNisco Rayome, 2016). Other institutions, such as Carnegie Mellon, have also engaged in efforts to promote a more inclusive environment within the field of computer science and have similarly seen significant increases in the percentage of female computer science majors (Sydell, 2017).

There are also a variety of initiatives within informal learning settings, both in the U.S. and around the world, that aim to make coding a more inclusive discipline. For example, the U.S.-based AI4ALL program seeks to empower groups of high school-

aged youth from underrepresented communities, including women, to learn the basics of AI and apply them to societal issues (AI4ALL, n.d.). The initiative offers university-based summer programs and an educational program that can be integrated in formal and informal learning settings. One alum, Lindsay, for example, applied her learnings from the program at a NASA internship, where she is leveraging machine learning to help develop a technology that will be incorporated in rovers looking for evidence of life on Mars (AI4ALL, 2019a). The program also seeks to connect youth to a mentorship network of researchers, institutions, and organizations (AI4ALL, 2019b). Data from AI4ALL’s most recent 2019 summer program demonstrates that youth alumni feel a sense of belonging and community with others in the AI field, an interest in further exploring AI, and a connection to mentors (AI4ALL, 2019b). More specifically, a majority of alumni indicated that 1) they feel they are part of an AI and computer science community (88%), 2) are interested in pursuing a career in AI (81%), 3) and have female role models in AI (86%).

Outside of the U.S., Indian Girls Code is a program that offers free coding and robotics education to young girls (Rajendra, 2018). The initiative brings coding lessons to after-school programs, summer camps, and an all-girls orphanage in India, where nearly 40 girls are taught robotics and coding every week (Pal, 2017). Similar to AI4ALL and Harvey Mudd’s educational programs, Indian Girls Code focuses on real-world applications of AI, such as using coding to create animations showing the harmful impact of pollution. The initiative also aims to make coding accessible to all learners. In this vein, the program has developed an educational robot, Philo, that can adapt to learners with varying levels of proficiency (Pal, 2017). In Latin America, the program Laboratoria, designed for an older age range (ages 18 and up), offers a six-month program to help prepare young women, particularly those from low-income backgrounds, to succeed as web developers (Laboratoria, n.d.). In addition to cultivating participants’ coding skills, the initiative, which runs programming in locations including Peru,

Chile, and Mexico, focuses on women's self-esteem. Students consult with the initiative's psychologists as part of their training to help mitigate the barriers women face in the computer science industry (Dalia Gonzalez, 2016).

In Africa, the mentorship and educational program Tech Needs Girls, based in Ghana, provides coding lessons to girls, with a focus on reaching girls from underrepresented communities (Soronko Solutions, n.d.). Participants are taught by 200 female engineers and computer scientists, who act as both role models and mentors for the young girls while cultivating their coding skills. Founder Regina Agyare describes the importance of mentorship in helping to bring more women to the ICT field: "Women and girls do not have many female role models who work in the field of ICT that they can look up to. We are socialized to attend school, get a job, and get married" (López, 2018, para. 10). She further notes that "entrepreneurship is seen as a risk, but we need to start socializing girls to think differently and start taking risks" (López, 2018, para. 10). The program has trained over 4,000 girls across eight regions of Ghana, some of whom have later developed online businesses, and one of whom created a website to promote awareness around sickle cell disease (López, 2018).

Whether implemented in formal or informal settings, these initiatives helping to bring more women to the computer science field have three key themes in common: 1) cultivating a strong support and mentorship network, 2) creating engaging, collaborative opportunities that help youth apply their understanding of computer science to societal problems impacting communities, and 3) making the field of computer science accessible to learners with varying levels of background knowledge in this field (e.g., through multilevel introductory courses).



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APPENDIX A⁴⁵

This Appendix A includes the full list of 35 frameworks we examined on digital citizenship, and related concepts (e.g., digital literacy, 21st century skills). To view a visualization of these frameworks in the context of our 17 areas of life connected to the digital world (that comprise our “digital citizenship+ (plus)” framework), please see part III, section 3 of this paper. In this appendix, you may find the following information for each stakeholder: 1) Framework author, 2) Author sector(s), 3) Headquarters, 4) Framework title, 5) Term(s) used (e.g., “digital citizenship,” “online safety”), 6) Year updated, 7) Point(s) of contact or general inquiries email, and 8) Link to the referred source.

#	Framework Author	Author Sector(s)	Head-quarters	Framework Title	Term(s) Used	Year Updated	Point(s) of Contact or General Inquiries Email	Link to Referred Source
1	Child Exploitation and Online Protection Command	Government	London, U.K.	ThinkUKnow	Online safety	2019	communication@nca.gov.uk	Source (ages 11-13 and 14+)
2	Common Sense, Project Zero	Non-governmental organization (NGO), Academia	San Francisco, CA, U.S., and Cambridge, MA, U.S., respectively	Digital Citizenship Curriculum	Digital citizenship	2019	Kelly Mendoza, Carrie James, and Emily Weinstein	Source (Grades 6-12)
3	Convergence Design Lab	Academia	Chicago, IL, U.S.	The 3 C's of Connect, Consume, Create, and Six Pillars of Instructional Design	21st century skills	2015	Mindy Faber	Source
4	CyberSecurity Malaysia	Government	Selangor, Malaysia	CyberSAFE Malaysia	Cyber safety	2010	cybersafe@cybersecurity.my	Source
5	DQ Institute	NGO	Singapore	Digital Intelligence (DQ) Framework	Digital citizenship, Digital creativity, Digital competitiveness	2019	contact@DQinstitute.org	Source
6	Enlaces	Government	Santiago, Chile	Rules for Digital Citizenship and a Safe Internet	Digital citizenship, Internet safety	2016	internetsegura@fct.pt	Source

⁴⁵ N.B.: For Perma.cc links in this Appendix A, to access full site functionality (e.g., to be redirected to secondary links and view embedded videos), please click “View the live page” in the top right corner.

#	Framework Author	Author Sector(s)	Head-quarters	Framework Title	Term(s) Used	Year Updated	Point(s) of Contact or General Inquiries Email	Link to Referred Source
7	EU Kids Online	Academia	London, U.K.	Digital Citizenship	Digital citizenship	2017	Tijana Milosevic, Elisabeth Staksrud, David Šmahel, and Sonia Livingstone	Source
8	European Commission	Government	Brussels, Belgium	DigComp 2.1: Digital Competence Framework for Citizens	Digital competence	2017	Stephanie Carretero, Riina Vuorikari, and Yves Punie	Source
9	Global Digital Citizen Foundation (GDCF)	NGO	Vancouver, British Columbia, Canada	The Essential Fluencies	Global digital citizenship	2017	Lee Watanabe Crockett	Source
10	Good Play Project and Project New Media Literacies	Academia	Cambridge, MA, U.S., and Los Angeles, CA, U.S., respectively	Our Space Curriculum	New media literacies, Ethical thinking skills	2011	Howard Gardner, Henry Jenkins	Source
11	Hobbs, Renee	Academia	Kingston, RI, U.S.	Digital and Media Literacy	Digital and media literacy	2010	Renee Hobbs	Source
12	International Computer Driving License (ICDL) Foundation	NGO	Primary site dependent upon regional focus	International Computer Driving License	Computer skills	2019	General inquiry form. Contact email will depend upon regional focus	Source
13	International Society for Technology in Education (ISTE)	NGO	Arlington, VA, U.S.	ISTE Standards for Students	Digital citizen	2016	standards@iste.org	Source
14	Jones, Lisa and Mitchell, Kimberly	Academia	Durham, NH, U.S.	Digital Citizenship	Digital citizenship	2016	Lisa Jones, Kimberly Mitchell	Source

#	Framework Author	Author Sector(s)	Head-quarters	Framework Title	Term(s) Used	Year Updated	Point(s) of Contact or General Inquiries Email	Link to Referred Source
15	Lindsay, Julie and Davis, Vicki	Academia	New South Wales, Australia, and Albany, Georgia, U.S. respectively	Enlightened Digital Citizenship	Digital citizenship	2013	Julie Lindsay, Vicki Davis	Source
16	Malaysian Communications and Multimedia Commission	Government	Cyberjaya, Malaysia	Klik Dengan Bijak	Internet safety	2014	kdb@cmc.gov.my	Source
17	Means and Measures of Human Achievement (MHA) Labs	NGO	Chicago, IL, U.S.	The Building Blocks	21st century skills	2013	Leslie Beller	Source
18	MediaSmarts	NGO	Ottawa, Ontario, Canada	Digital and Media Literacy Fundamentals	Digital literacy, Media literacy	2019	Matthew Johnson	Source
19	Media Literacy Council	NGO	Singapore	Be Safe, Be Smart, and Be Kind	Media literacy, cyber wellness	2019	info@medialiteracycouncil.sg	Source
20	Media Literacy Now	NGO	Watertown, MA, U.S.	Media Literacy	Media literacy, digital citizenship	2016	Erin McNeill	Source
21	Mossberger, Karen; Tolbert, Caroline; and McNeal, Ramona	Academia	Phoenix, AZ, U.S.; Iowa City, IA, U.S.; and Cedar Falls, IA, U.S. respectively	Digital Citizenship	Digital citizenship	2007	Karen Mossberger, Caroline Tolbert, and Ramona McNeal	Source
22	National Association for Media Literacy Education (NAMLE)	NGO	New York, NY, U.S.	Core Principles of Media Literacy Education	Media literacy	2007	Michelle Ciulla Lipkin	Source

#	Framework Author	Author Sector(s)	Head-quarters	Framework Title	Term(s) Used	Year Updated	Point(s) of Contact or General Inquiries Email	Link to Referred Source
23	National Coalition for Core Arts Standards (NCCAS)	NGO	U.S.-wide	National Core Arts Standards - Media Arts	Media arts	2014	Dain Olsen	Source
24	Netsafe	NGO	Auckland, New Zealand	Defining Digital Citizenship in New Zealand Education	Digital citizenship	2018	Neil Melhuish	Source
25	New South Wales (NSW) Department of Education	Government	Sydney, New South Wales, Australia	Digital Citizenship	Digital citizenship	2019	DoEinfo@det.nsw.edu.au	Source
26	PantallasAmigas	NGO	Bilbao, Spain	Digital Citizenship	Digital citizenship	2019	Jorges Flores Fernandez	Source (All sub-headings under "Ciudadanía Digital" ("Digital Citizenship"))
27	Partnership for 21st Century Learning (P21)	NGO	Columbus, Ohio, U.S.	Framework for 21st Century Learning	21st century skills	2019	thellman@battelleforkids.org	Source
28	Ribble, Mike	Academia	Topeka, Kansas, U.S.	Nine Elements of Digital Citizenship and S3 (Safe, Savvy, and Social) Framework	Digital citizenship	2019	Mike Ribble	Source
29	Singapore Ministry of Education (MoE)	Government	Singapore	MoE's Cyber Wellness Framework	Cyber wellness	2018	contact@moe.gov.sg	Source
30	Spy Hop Productions	NGO	Salt Lake City, Utah	Spy Hop Way	Digital media arts	2019	Kasandra VerBruggen	Source

#	Framework Author	Author Sector(s)	Head-quarters	Framework Title	Term(s) Used	Year Updated	Point(s) of Contact or General Inquiries Email	Link to Referred Source
31	United Nations Children's Fund (UNICEF)	International organization	New York, NY, U.S.	Digital citizenship	Digital citizenship, Digital literacy	2017	Jasmina Byrne	Source
32	United Nations Educational, Scientific and Cultural Organization (UNESCO)	International organization	Paris, France	Media and Information Literacy	Media and information literacy	2011	Alton Grizzle (under "Contact")	Source
33	Washington State Legislature	Government	Olympia, Washington, U.S.	Substitute Senate Bill 6273 - Washington State Legislature	Digital citizenship, media literacy, Internet safety	2016	Dennis Small (under "Contact Information")	Source
34	World Bank	International organization	Washington, D.C., U.S.	Digital Engagement Evaluation	Digital citizen engagement	2016	Tiago Peixoto	Source
35	World Economic Forum (WEF)	International organization	Cologny-Geneva, Switzerland	21st-Century Skills	21st-century skills	2015	contact@weforum.org	Source

APPENDIX B

This Appendix B provides the initial, full list of 40 areas of life connected to the digital world our YaM team developed – in the context of our framework mapping (see part III, section 1 of this paper) – in collaboration with Berkman Klein Center fellows, staff, and summer interns. We ultimately reduced this list to 17 areas of life, provided in part III, section 2 (our “digital citizenship+ (plus)” framework).

1. Digital Divide: Acknowledgment of the digital divide in terms of Internet access, basic digital literacy, and frequency and intensity of Internet use, and the implications of this divide with respect to inclusion and inequality.
2. Connectivity: Knowing how to connect to and access the Internet, individually or collectively (e.g., mesh technologies, wi-fi sharing).
3. Information Literacy: The ability to locate, evaluate (the quality of), and effectively use information from online sources.
4. Media and Digital Literacy: The ability to engage in an array of activities needed for full participation in our media-saturated, information-rich society, including the capacity to analyze media messages; engage in participatory action; create content online; and locate and share information in a responsible way.
5. Attention Economy: The understanding that Internet use happens within an environment where one’s attention is a currency and commodity. This area also includes the skills needed to consume and distribute information in a more efficient way, and the ability to produce influential content.
6. Storytelling: The ability to tell stories (combining digital and physical resources) in an engaging way.
7. Online Broadcasting: The ability to create systematic but decentralized communication channels to spread content under the one-to-many model, live or pre-recorded.
8. Influence Capacity: The capacity to produce and distribute content with the support of digital tools to maximize one’s potential influence.
9. Data: Understanding how companies (e.g., Facebook, Google) collect and analyze one’s data, and understanding data analytics tools and methods. Part of data encompasses the understanding of big data (i.e., understanding the positive and negative implications of massive data gathering, centralization, and analysis).
10. Artificial Intelligence and Algorithms: Understanding of the AI systems one encounters, the algorithms involved in the platforms one interacts with, and the ethical conversations happening around the development of these technologies.
11. Identity Building: The knowledge and tools to use digital technologies to explore elements of one’s own identity, examine how one’s identity is shared and shaped by others, and the capacity to leverage these technologies to freely express one’s identity.
12. Belonging and Affiliation: The ability to create or join online or offline communities of interest using digital technologies.
13. Agency: The process of developing the knowledge, skills, and motivation to pursue one’s goals and/or solve personal or collective problems by taking action and responsibility.
14. Purpose: The understanding of how to use digital tools to work towards fulfilling one’s personal purpose(s).

15. Leadership: Using digital technologies to organize groups of people around a common goal, communicate and manage tasks effectively, and establish and promote trust.
16. Healthy Relationships: The ability to engage in healthy relationships with others (both romantic- and friendship-based relationships), in-person and through digital platforms, by creating and maintaining 1) effective communication patterns, and 2) respect for each other.
17. Digital Contributions: The motivation to engage in active contributions to digital spaces (i.e., "Leave Your Mark").
18. Digital Wellness: Understanding how to protect one's physical and psychological well-being in an online world (e.g., guarding against Internet addiction, and repetitive stress syndrome).
19. Privacy: The knowledge and skills to handle personal information shared online with discretion, and the ability to protect the privacy of both self and peers.
20. Digital Footprint: The capacity to manage one's digital reputation responsibly, and the awareness of both the short- and long-term effects of one's digital footprint.
21. Offline Social Awareness: The ability to appropriately interpret situations and maintain interpersonal abilities when interacting with others face-to-face while in the presence of digital technologies.
22. Law and Regulation: Knowledge of the legal frameworks surrounding the Internet and other digital tools (e.g., copyright, fair use).
23. Digital Rights and Responsibilities: Knowledge of the rights and responsibilities involved in the use of digital technologies (e.g., reporting instances of abuse, acknowledgement of copyright).
24. Freedom of Expression: An understanding of concepts such as illegitimate surveillance, filtering, and censorship, and how to interact with these issues.
25. Netiquette: Digital good manners or observance of informal codes of conduct to make the Internet inclusive, usable, useful, amicable, and peaceful.
26. Safety: The knowledge and ability needed to counteract the risks that digital tools present to protect one's physical and mental integrity.
27. Security: The knowledge and ability needed to protect the integrity of one's information, IT systems, and digital assets.
28. Activism, Advocacy, and Organizing: Using digital technologies to advance a collective cause. This encompasses the capacity to create public narratives that are capable of mobilizing support around specific themes (e.g., LGBTQ rights, peace building, addressing hate speech).
29. Collective Action: Gathering community support/materials online for a project or cause (e.g., crowdsourcing, crowdfunding, volunteering).
30. Digital Tools for Rights: The use of digital technologies to actively protect fundamental human rights (e.g., freedom of expression).
31. Cultural/global Competence: Awareness of cultural nuances, and regional differences that exist in other parts of the world, and the ability to empathize and work well online with others from various cultures/ backgrounds.

- 
32. Power Relationships: Understanding power relationships/structures in society and how digital technologies are capable of counteracting or changing these (e.g., access to knowledge, social mobility).
 33. Social Entrepreneurship and Innovation (Public Problem-solving): Use of digital technologies to foster entrepreneurship to solve local problems.
 34. Sharing of Informal Expertise: Awareness of one's informal expertise in a specific topic and the skills to share that expertise in a digital space (e.g., video tutorials).
 35. Digital Economy: Knowing how to navigate the digital economy as either a consumer or producer.
 36. Civic Engagement: Knowing how to participate and/or take action to promote the quality of life in one's community, from micro to macro levels.
 37. E-government: The ability to access and use online services and information provided by the government.
 38. Politics and Democratic Behavior: The ability to engage in democratic behaviors using digital technologies (e.g., online voting).
 39. Online Participation Skills: The awareness and use of digital tools to convey opinions and requests to the government, or voice one's opinion in general online collective spaces (e.g., participatory budgeting, online petitions).
 40. Internet Governance: Knowledge of the institutions, models, and infrastructures that govern the Internet.

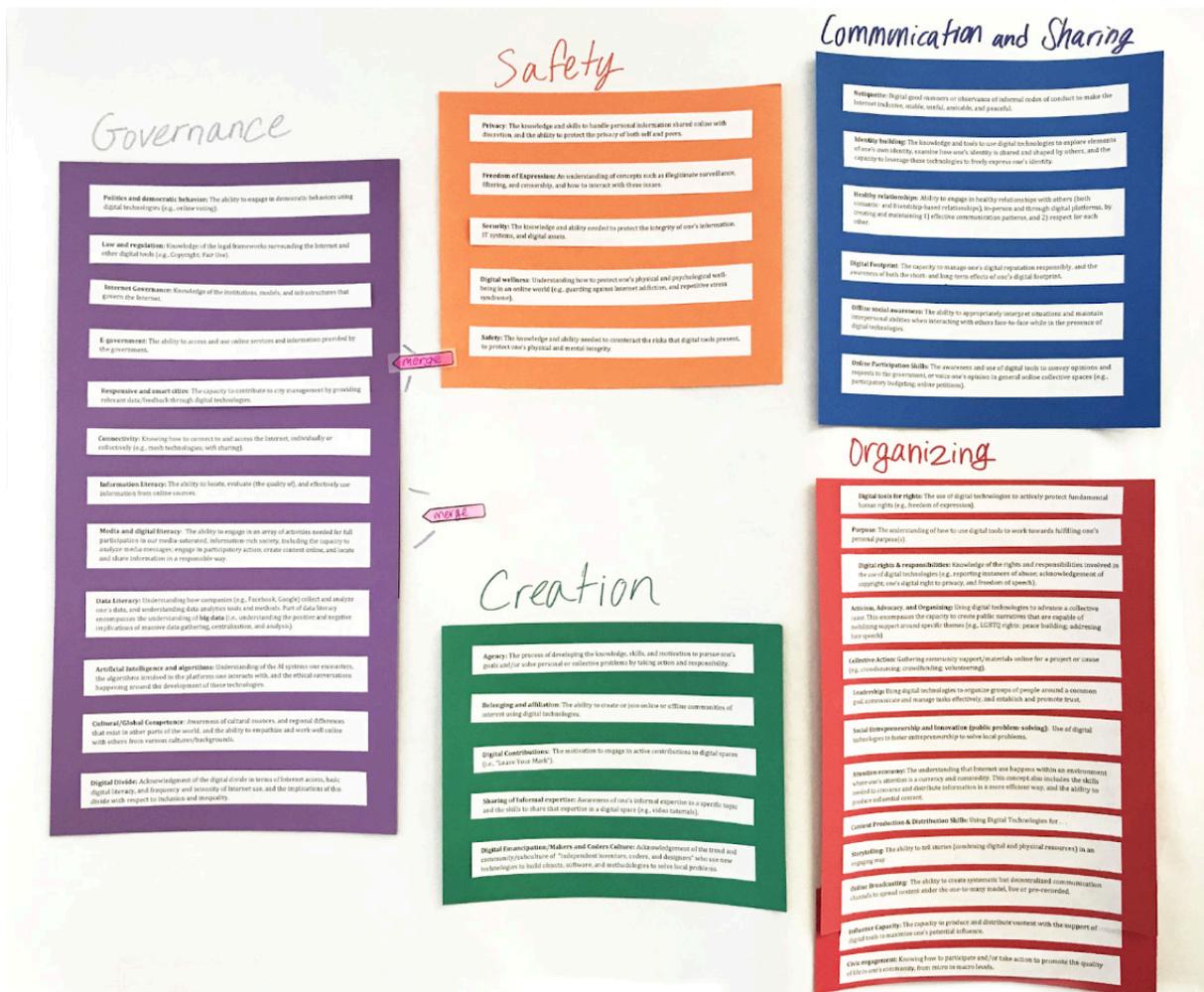
APPENDIX C

This Appendix C provides a subset of photos from our team's exercise with Berkman Klein fellows, staff, and summer interns around grouping proposed areas of life connected to the digital world under overarching umbrella headings (such as "the engaged Internet," "the interpersonal Internet," etc.), with images grouped by Berkman Klein community member. This exercise was conducted in the context of our framework mapping (see part III, section 1 of this paper).

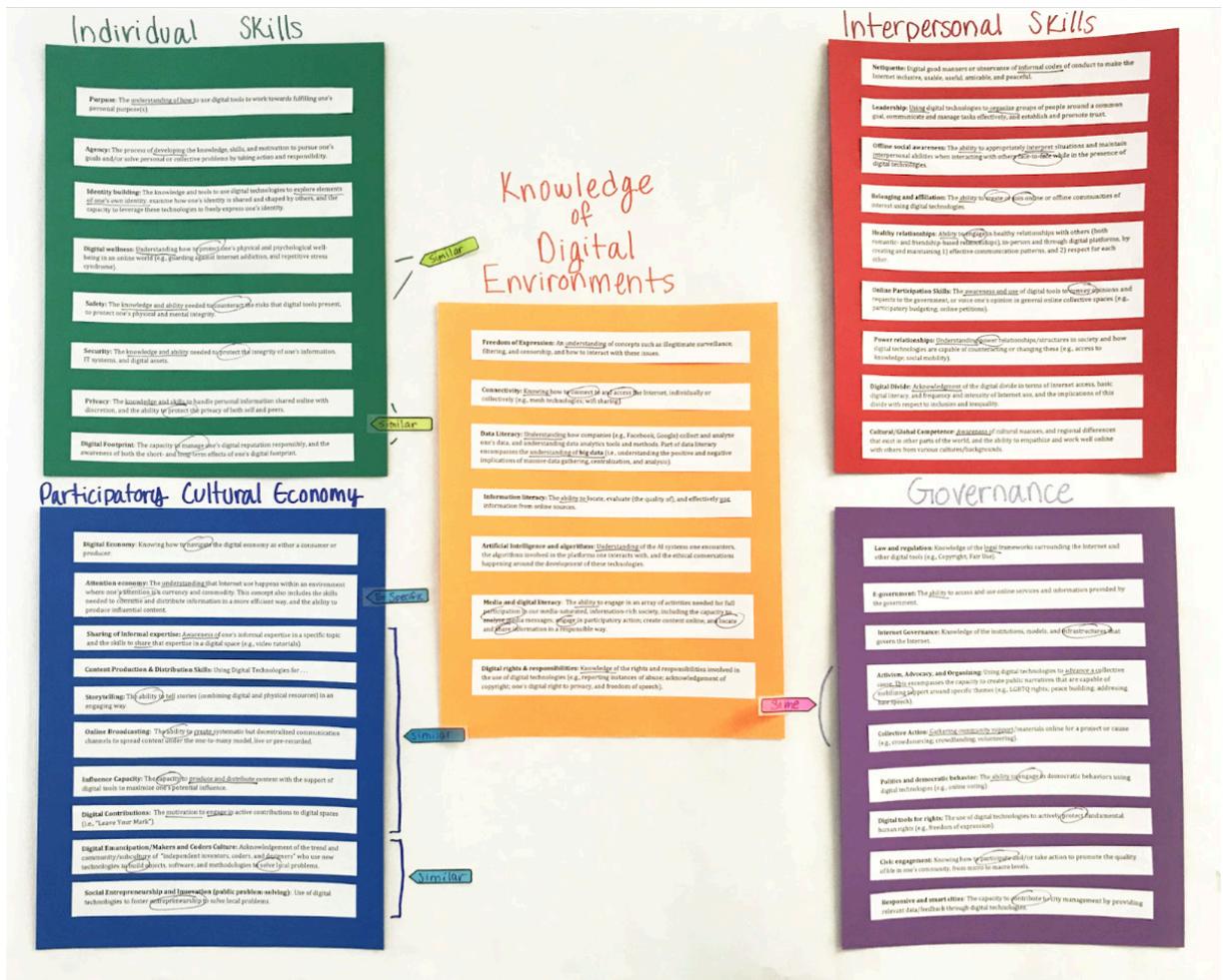
Exercise instructions:

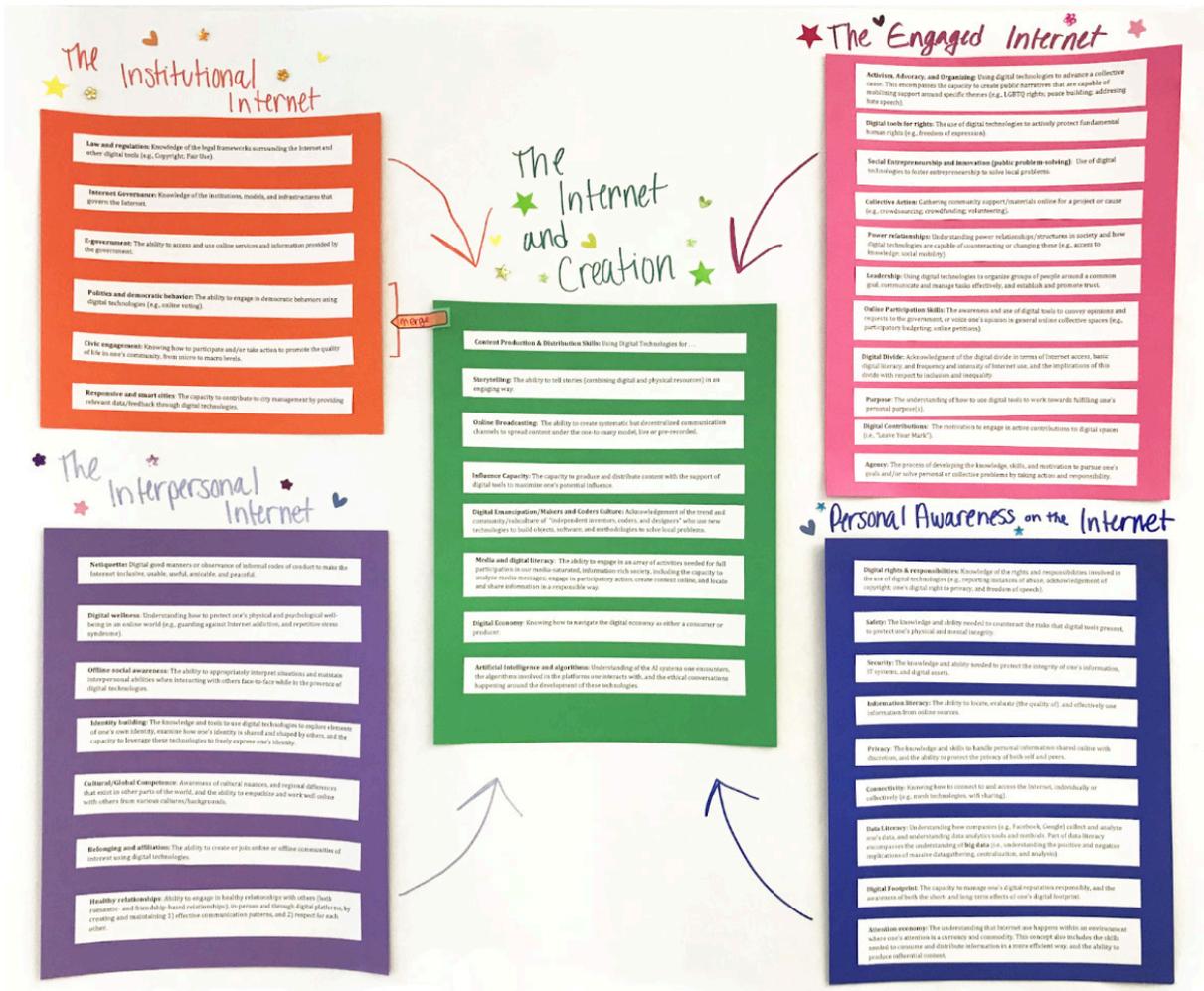
1. Look over the 40 terms and definitions related to digital citizenship.
2. Divide the terms into approximately five groups (ideally of similar size), each based on a common theme or characteristic, and name the groups.
3. For each of your thematic groups, rank the terms you have placed within it from most to least important.
4. Glue these ranked lists to your poster board/sheet of paper and label the groups.

Person #1 – YaM Research Assistant



Person #2 – former YaM Research Assistant





Person #4 – Fellow

YOU + PARTICIPATING

- Information literacy:** The ability to locate, evaluate (the quality of), and effectively use information from online sources.
- Cultural/Globel Competence:** Awareness of cultural nuances, and regional differences that exist in other parts of the world, and the ability to empathize and work well online with others from various cultures/backgrounds.
- Freedom of Expression:** An understanding of concepts such as legitimate surveillance, filtering, and censorship, and how to interact with these issues.
- Digital rights & responsibilities:** Knowledge of the rights and responsibilities involved in the use of digital technologies (e.g., reporting instances of abuse, acknowledgment of copyright, one's digital right to privacy, and freedom of speech).
- Law and regulation:** Knowledge of the legal frameworks surrounding the internet and other digital tools (e.g., Copyright, Fair Use).
- Digital tools for rights:** The use of digital technologies to actively protect fundamental human rights (e.g., freedom of expression).
- Leadership:** Using digital technologies to organize groups of people around a common goal, communicate and manage tasks effectively, and establish and promote trust.
- Civic engagement:** Knowing how to participate and/or take action to promote the quality of life in one's community, from micro to macro levels.
- Activism, Advocacy, and Organizing:** Using digital technologies to advance a collective cause. This encompasses the capacity to create public narratives that are capable of mobilizing support around specific themes (e.g., LGBTQ rights, peace building, addressing hate speech).
- Collective Action:** Gathering community support/materials online for a project or cause (e.g., crowdfunding, crowdfunding, volunteering).
- Digital Economy:** Knowing how to navigate the digital economy as either a consumer or producer.
- Politics and democratic behavior:** The ability to engage in democratic behaviors using digital technologies (e.g., online voting).
- E-government:** The ability to access and use online services and information provided by the government.
- Connectivity:** Knowing how to connect to and access the internet, individually or collectively (e.g., mesh technologies, wifi sharing).
- Online Participation Skills:** The awareness and use of digital tools to convey opinions and requests to the government, or voice one's opinion in general online collective spaces (e.g., participatory budgeting, online petitions).
- Attention economy:** The understanding that internet use happens within an environment where one's attention is a currency and commodity. This concept also includes the skills needed to consume and distribute information in a more efficient way, and the ability to produce influential content.
- Media and digital literacy:** The ability to engage in an array of activities needed for full participation in our media-saturated, information-rich society, including the capacity to analyze media messages, engage in participatory action, create content online, and locate and share information in a responsible way.
- Purpose:** The understanding of how to use digital tools to work towards fulfilling one's personal purpose(s).
- Digital Contributions:** The motivation to engage in active contributions to digital spaces (e.g., "Leave Your Mark").
- Content Production & Distribution Skills:** Using Digital Technologies for ...
- Storytelling:** The ability to tell stories (combining digital and physical resources) in an engaging way.
- Influence Capacity:** The capacity to produce and distribute content with the support of digital tools to maximize one's potential influence.
- Social Entrepreneurship and Innovation (public problem-solving):** Use of digital technologies to foster entrepreneurship to solve local problems.
- Sharing of Informal expertise:** Assessment of one's informal expertise in a specific topic and the skills to share that expertise in a digital space (e.g., video tutorials).

YOU
YOU + TECH/DATA
YOU + SOCIAL

- Identity building:** The knowledge and tools to use digital technologies to explore elements of one's own identity, examine how one's identity is shared and shaped by others, and the capacity to leverage these technologies to freely express one's identity.
- Belonging and affiliation:** The ability to create or join online or offline communities of interest using digital technologies.
- Privacy:** The knowledge and skills to handle personal information shared online with discretion, and the ability to protect the privacy of both self and peers.
- Digital Footprint:** The capacity to manage one's digital reputation responsibly, and the awareness of both the short- and long-term effects of one's digital footprint.
- Agency:** The process of developing the knowledge, skills, and motivation to pursue one's goals and/or solve personal or collective problems by taking action and responsibility.

- Data Literacy:** Understanding how companies (e.g., Facebook, Google) collect and analyze one's data, and understanding data analytics tools and methods. Part of data literacy encompasses the understanding of big data (i.e., understanding the positive and negative implications of massive data gathering, centralization, and analysis).
- Artificial intelligence and algorithms:** Understanding of the AI systems one encounters, the algorithms involved in the platforms one interacts with, and the ethical conversations happening around the development of these technologies.
- Internet Governance:** Knowledge of the institutions, models, and infrastructures that govern the internet.
- Security:** The knowledge and ability needed to protect the integrity of one's information, IT systems, and digital assets.

- Digital wellness:** Understanding how to protect one's physical and psychological well-being in an online world (e.g., guarding against internet addiction, and repetitive stress syndrome).
- Safety:** The knowledge and ability needed to counteract the risks that digital tools present, to protect one's physical and mental integrity.
- Offline social awareness:** The ability to appropriately interpret situations and maintain interpersonal abilities when interacting with others face-to-face while in the presence of digital technologies.
- Netiquette:** Digital good manners or observance of informal codes of conduct to make the internet inclusive, usable, useful, amicable, and peaceful.
- Healthy relationships:** Ability to engage in healthy relationships with others (both romantic and friendship-based relationships), in person and through digital platforms, by creating and maintaining 1) effective communication patterns, and 2) respect for each other.
- Power relationships:** Understanding power relationships (structures in society and how digital technologies are capable of counteracting or changing these (e.g., access to knowledge, social mobility)).

APPENDIX D

Table 2

K-12 Grades And Approximate Corresponding Ages In U.S. Education

Educational Level	School type	Grade	Age (approx.)	
Primary Education	Elementary School	Kindergarten	5-6	
		1	6-7	
		2	7-8	
		3	8-9	
		4	9-10	
		5	10-11	
Secondary Education	Middle (Junior High) School	6	11-12	
		7	12-13	
		8	13-14	
	High School	9	14-15	
		10	15-16	
		11	16-17	
		12	17-18	
	Post-secondary (Tertiary) Education	College/Undergraduate[i]	Freshman	18-19
			Sophomore	19-20
			Junior	20-21
			Senior	21-22
Graduate School[ii] or Professional (Varies)		22+		

Primary and secondary education are compulsory, and are referred to collectively as "K-12 [K through 12] education," after this, ages typically become more variable.

[i] In the U.S. context, college is a noun referring to the institution, either a stand-alone institution or as a constituent of a larger university, but is also used as an adjective as in "college education," "college degree," and "college students." Undergraduate refers to the student, but may also be used as an adjective in "undergraduate education," "undergraduate degree," and "undergraduate institution." Despite formal redundancy, the phrase "undergraduate students" is also common usage. The typical undergraduate degree is the four-year bachelor's degree, but some institutions such as community colleges and junior colleges award the two-year associate's degree, considered the equivalent of the first two years of a bachelor's degree course. Note that in the United States, unlike many other countries, a professional degree (mainly, the four-year M.D. medical degree and the three-year J.D. legal degree) is an advanced degree obtained after the undergraduate degree. Master's degree programs are also not typically offered as part of college education, and require a separate application process and admission with a bachelor's degree as a prerequisite.

[ii] High school grades are numbered, but the terms freshman, sophomore, junior, and senior are also frequently used. If educational level is not clear in context, these terms will be preceded by "high school" or "college," as in "high school sophomore" and "college sophomore").



SPOTLIGHT
SERIES

Youth and Artificial Intelligence: WHERE WE STAND

Alexa Hasse Sandra Cortesi Andres Lombana-Bermudez Urs Gasser



**BERKMAN
KLEIN CENTER**
FOR INTERNET & SOCIETY
AT HARVARD UNIVERSITY



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SUGGESTED CITATIONS

APA

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Chicago (Bibliography)

Hasse, Alexa, Sandra Cortesi, Andres Lombana-Bermudez, and Urs Gasser. "Youth and Artificial Intelligence: Where We Stand," Youth and Media, Berkman Klein Center for Internet & Society (2019), accessed on [Month Day, Year], <https://cyber.harvard.edu/publication/2019/youth-and-artificial-intelligence/where-we-stand>

Chicago (Footnote)

Alexa Hasse, Sandra Cortesi, Andres Lombana-Bermudez, and Urs Gasser. "Youth and Artificial Intelligence: Where We Stand," Youth and Media, Berkman Klein Center for Internet & Society (2019), accessed on [Month Day, Year], <https://cyber.harvard.edu/publication/2019/youth-and-artificial-intelligence/where-we-stand>.

MLA

Hasse, Alexa, Sandra Cortesi, Andres Lombana-Bermudez, and Urs Gasser. "Youth and Artificial Intelligence: Where We Stand." *Youth and Media, Berkman Klein Center for Internet & Society*, 2019. Web. [Day Mon. Year]. <<https://cyber.harvard.edu/publication/2019/youth-and-artificial-intelligence/where-we-stand>>.

Bluebook

Alexa Hasse, Sandra Cortesi, Andres Lombana-Bermudez, and Urs Gasser. YOUTH AND ARTIFICIAL INTELLIGENCE: WHERE WE STAND (2019), available at <https://cyber.harvard.edu/publication/2019/youth-and-artificial-intelligence/where-we-stand>.

KEYWORDS

Youth, young people, children, adolescents, teenagers, high school, middle school, digital media, Internet, online, artificial intelligence, education, health, well-being, privacy, safety, future of work, creativity, entertainment.

PUBLICATION DATE

May 2019

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Special thanks to Leah Plunkett for her invaluable guidance and input around AI-based technologies and student privacy. Thank you also to Rey Junco, Lionel Brossi, and Amanda Kraley for reading a draft version of this spotlight and providing comments and feedback.

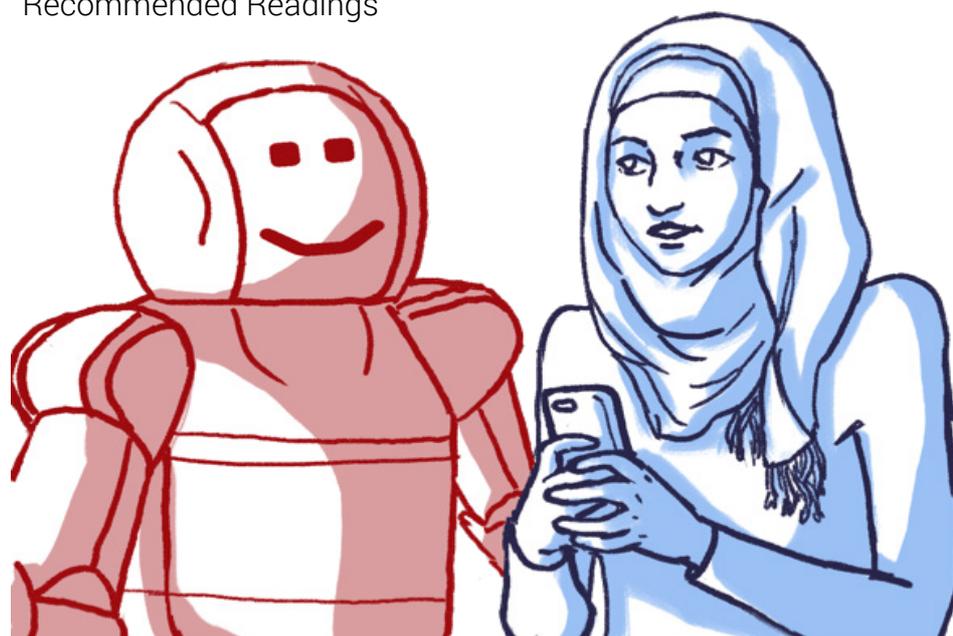
Youth and Artificial Intelligence: Where We Stand

By Alexa Hasse, Sandra Cortesi, Andres Lombana-Bermudez, & Urs Gasser.

This spotlight seeks to share Youth and Media's initial learnings and key questions around the intersection between artificial intelligence (AI) and youth (ages 12-18), in the context of domains such as education, health and well-being, and the future of work. It aims to encourage various stakeholders – including policymakers, educators, and parents and caregivers – to consider how we can empower young people to meaningfully interact with AI-based technologies to promote and bolster learning, creative expression, and well-being, while also addressing key challenges and concerns.

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I. INTRODUCTION

While much has been written about the impacts of artificial intelligence (AI) on society more broadly, little work has focused on how youth (12-18-year-olds) interact with and are impacted by AI. This spotlight reviews recent¹ literature and examples² on artificial intelligence and its impact on the lives of youth³ in domains such as education, health and well-being, creativity and entertainment, and the future of work.⁴ This piece is not intended to be a comprehensive discussion of all the challenges and opportunities that AI presents for young people; instead, the spotlight aims to highlight some of the Youth and Media team's initial exploratory learnings and questions around the interplay between AI and youth. The main aim is to share preliminary observations as well as highlight questions for a concerned public audience and provide different entry points for further exploration our team is pursuing.

The writing of this piece was inspired by four main questions:

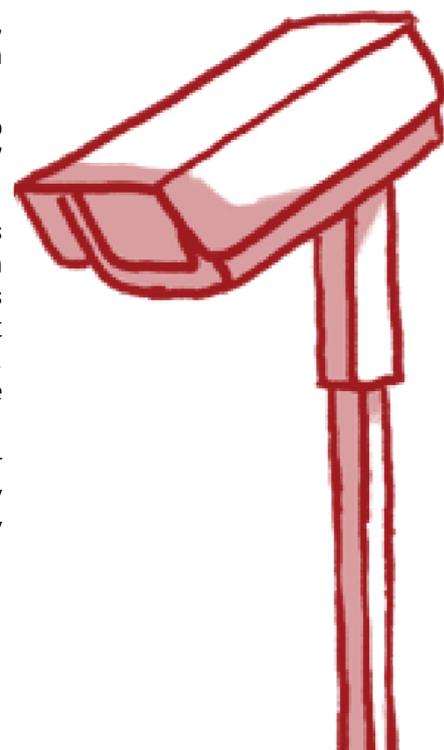
- What are the domains of young people's lives impacted by AI (e.g., education, work, health and well-being) and, thus far, what does the research tell us about youth and AI in these contexts?
- What takeaways from prior research around youth and other forms of digital technologies can be examined with respect to AI?
- Within each domain of research, what are some relevant readings and initial questions related to youth we should be asking? If you feel that questions are missing in this spotlight, please share them with us, noting the specific domain(s) the questions fall under, through this [brief survey \(http://brk.mn/yamyouthandaiadditionalquestions\)](http://brk.mn/yamyouthandaiadditionalquestions).
- How might we empower young people to meaningfully interact with AI-powered technologies to promote and bolster learning, health and well-being, and creative expression, while also addressing key challenges and concerns?

1 We largely focused on reviewing reports, articles in scholarly journals, newspaper articles, and other outputs that have been published between 2017-2019.

2 N.B.: For Perma.cc links, for full site functionality (e.g., to be redirected to secondary links and view embedded videos), please click "View the live page" in the top right corner.

3 As our team focuses on youth ages twelve to eighteen, throughout this piece, we primarily excluded research and news articles that concentrate on the ways adults engage with and are impacted by AI-based technologies, as well as younger children (i.e., under age 12) — particularly in cases where it was unclear how and why the content was relevant to the youth population. For additional information on AI and society more broadly, please visit the Berkman Klein Center's website: <https://cyber.harvard.edu>.

4 If you would like to learn more about the domains discussed in this paper as they relate to youth and digital technologies, a helpful starting point may be *Born Digital: How Children Grow Up in a Digital Age* (2016) by John Palfrey and Urs Gasser.



1. Overview of Initial Themes and Issues

Over the past several years, technologies based on AI have started [changing our daily lives](#). Innovations are rolled out at an accelerated pace, not only in professional working environments but also at home and in schools. [Hello Barbie](#) and [Cozmo](#) are just two examples of AI-enabled toys that have already made their way into some children's homes in the U.S., with many more in development around the world. AI-powered toys offer [playful and creative opportunities](#) for children, with some systems promoting enhanced [literacy](#), [social skills](#), and [language development](#).

Thus far, there is less research on the beneficial impact of AI-based systems specifically on adolescents, compared to young children. However, recent reports and studies indicate that AI is playing an increasingly important role in, for instance, the domains of education and learning, and health and well-being. Within the formal education setting, AI-powered educational technology (ed tech) – such as [intelligent tutoring systems](#), [tailored curriculum plans](#), and [intelligent virtual reality](#) – can improve [educational outcomes](#), and [offer rich and engaging interactive learning experiences](#) for youth. In informal and connected learning environments, such as MIT Media Lab's Scratch platform, youth have the opportunity to design and program AI-based [interactive games](#), [simulations](#), [chatbots](#), and [virtual robots](#) with great benefits for creativity, learning, and self-expression.

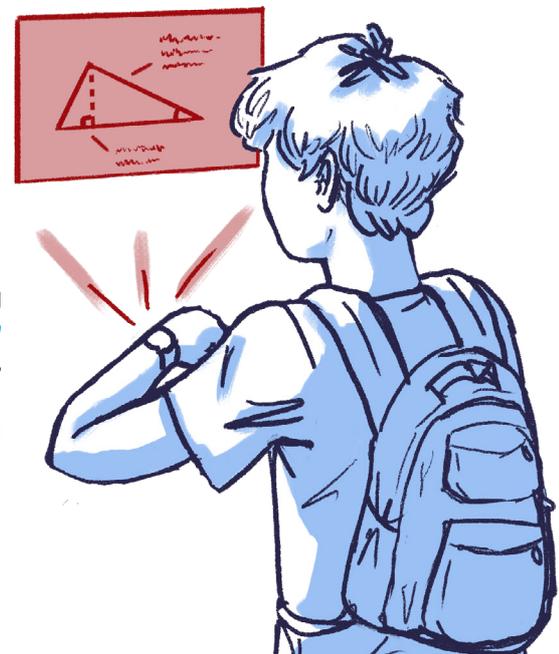
Within the domain of health and well-being, AI-driven applications are being designed and deployed to address health care concerns for young people – particularly in the context of mental and behavioral health – in the form of [diagnostic tools](#), [therapeutic chatbots](#), and [public health interventions](#). These technologies open up the potential for earlier intervention for vulnerable youth, increased access to and engagement with therapeutic services, and greater awareness around public health issues.

However, AI-based technologies also create [challenges](#) for young people that need to be addressed by a variety of stakeholders (including youth themselves in the conversation) to [safeguard and uphold young people's rights \(e.g., right to privacy, right to participation\)](#). Particularly in relation to privacy, there are serious concerns around how AI-powered toys and ed tech applications can collect and store personal data. There is a risk of undermining youth privacy if the companies that design AI-fueled technologies are not clear and ethical about how they collect user data, where that data is stored, who can access it, and what can be done with it. From the spoken dialogue between a teenager and a digital personal assistant to the record of geographic locations a high school student creates when using an ed tech homework app, a wide range of personal information from young users can be recorded and stored as they interact with AI-powered systems. Thus, it is crucial that AI-based technologies are designed in a responsible way that safeguards youth privacy, especially when, as we have seen in the online platforms ecosystem, personal data on the cloud raises concerns around [data privacy, security, and retention](#).



Additionally, the complex interplay between data sets and algorithms that power these “black box” AI systems – particularly when these systems are connected to the Internet – lead to pressing questions around [bias and discrimination](#), [transparency and accountability](#), and [privacy and safety](#). There are also important concerns around the impact that AI systems might have in amplifying existing social inequalities among youth of different races, socio-economic statuses, genders, and regions (e.g., Global North and Global South⁵). Obstacles to the adoption of AI-powered technologies in under-resourced schools and underrepresented homes could exacerbate existing gaps within the youth population with respect to access to AI systems and the skills to utilize them.

Last but not least, the deep knowledge gap separating most people affected by AI systems and their designers creates an information asymmetry that complicates and often threatens progress toward a [more inclusive](#) future.⁶ The youth population is a particularly vulnerable group, as very little has been done to [empower young people](#) to critically engage the discourse surrounding the next generation of technologies that have a marked potential to shape their lives for better or for worse. As just one example, innovations in artificial intelligence are helping to reshape the labor market, with important implications for [career trajectories](#), and the [requisite skills](#) for youth to thrive in this shifting occupational landscape. Taking into account the massive impact AI is predicted to have on their lives, it is critical that young people have a basic understanding of what AI is and the ethical, societal, and privacy- and safety-related implications of these technologies.



5 For more information about AI, inclusion, and well-being among youth in the Global South, please see the forthcoming [Inteligencia Artificial y bienestar de las juventudes en América Latina](#) by Lionel Brossi, Tomás Dodds, and Ezequiel Passeron.

6 To learn more about the Berkman Klein Center’s efforts around AI and inclusion, please visit <https://aiandinclusion.org>.

II. EDUCATION AND HEALTH AND WELL-BEING

Artificial intelligence systems are already enhancing the field of education by enabling a more customizable approach to teaching and learning. Additionally, AI-fueled technologies have begun to change the landscape of health and well-being, particularly within the area of mental health. While the interventions discussed in this part II are revolutionary in that they have the potential to promote engagement, learning, and well-being on a larger scale than previously possible, it is important to highlight the fact that, like many AI systems, these technologies are developed in ways that may restrict youth from underrepresented backgrounds from full participation.

1. Education

AI-powered ed tech in the classroom — such as [intelligent tutoring systems](#), AI-based [curriculum plans](#), and [intelligent virtual reality](#) — can [enhance educational outcomes](#), and [provide engaging learning experiences](#) for young people. AI-fueled curriculum plans, often referred to as “curriculum playlists,” and intelligent tutoring systems, offer personalized learning experiences for youth, [adapting instruction and feedback](#) to students’ capabilities and needs — the former, through daily individualized learning activities based on a curriculum the system curates for each student, and the latter through one-to-one tutoring that aims to mimic human tutoring. Intelligent tutoring systems may also be incorporated into other forms of educational technologies, such as virtual reality systems. A character within the immersive experience, for instance, might offer [AI-driven guidance and support](#), helping the user engage with the virtual world in ways that promote learning. Over time, as reduction in costs and increases in Internet connectivity allow more schools and homes to access AI-fueled technologies, the future of AI in education holds the potential for [personalized learning at scale](#). Further advances in the field of AI-based ed tech may also include the development of “[lifelong learning companions](#)” — intelligent systems accessible via mobile devices that accompany youth across all levels of schooling, in and beyond the classroom, offering feedback on tasks, suggested educational resources, and activities that promote 21st century skills, such as [leadership and creativity](#).

Particularly for youth from regions where high-quality education is limited, learning at scale has the potential to help democratize access to such education and provide more diverse learning opportunities. As some [early evidence on the impact of massive open online courses \(MOOCs\) in these regions](#) reveals, students from



low-income backgrounds with low levels of educational attainment have reported career benefits from taking such online courses. Moreover, AI-powered technologies such as automated translation offer the potential to customize and localize educational resources and content into the languages and contexts of these regions, helping to bridge the knowledge access gap.

Emerging Questions

1. How can we equip educators — especially those in low-resource communities — with the [skills and support](#) to implement AI-based technologies in the classroom in a thoughtful manner? What kind of training would educators require? How does privilege manifest itself in the means of education chosen by different groups/stakeholders? What is the prevailing narrative about AI and technology in the classroom, and [who shapes it](#)?
2. How can educators and students be included in the design process of AI-powered educational technologies?
3. How can we bring personalized, interest-driven learning to scale while addressing the [diversity of pathways and passions](#) that learners from different demographic backgrounds, cultures, and social contexts have?
4. How can we leverage AI-driven personalization at scale to promote access to education in regions of the world where education is challenging for the general population, including youth, to obtain? How can we ensure that these tools are meaningful for the youth who use them — in other words, how can these systems take into account learners' sociocultural [context](#)?
5. What kinds of safeguards could best mitigate potential [negative issues](#) related to using AI-based technologies in the classroom? How can we balance AI systems' [need for data](#) while safeguarding the privacy and security of sensitive student data, both at the individual and cohort levels? How can we ensure that both the AI ed tech itself and the human decision-makers who oversee and engage the AI will approach the acquisition, storage, transmission, and analysis of AI-based student data in an ethical way? Are there educational functions — either inside or outside of the classroom — that AI ed tech is uniquely positioned to fill in a positive manner? Are there functions it should not fill, for privacy, security, or ethical reasons?
6. Now that AI ed tech is gaining more traction in learning ecosystems, how do we implement and iterate upon the [earlier wave of ed tech privacy discussions](#) — especially best practice takeaways — that developed around [cloud-based ed tech](#)? Many of the opportunities and challenges around AI ed tech and student privacy and security were previewed in this earlier multistakeholder exploration, which included academic research, new industry standards, new state laws, and many other tools. There is a need to take stock: which AI ed tech, student privacy, and security questions might be answered, at least initially, with reference to some of these earlier efforts? Which current and emerging questions around AI ed tech were not covered by these efforts but might find some points of guidance or inspiration from them? Are there privacy and security questions that flow from AI ed tech that are completely outside the realm of prior discussion?

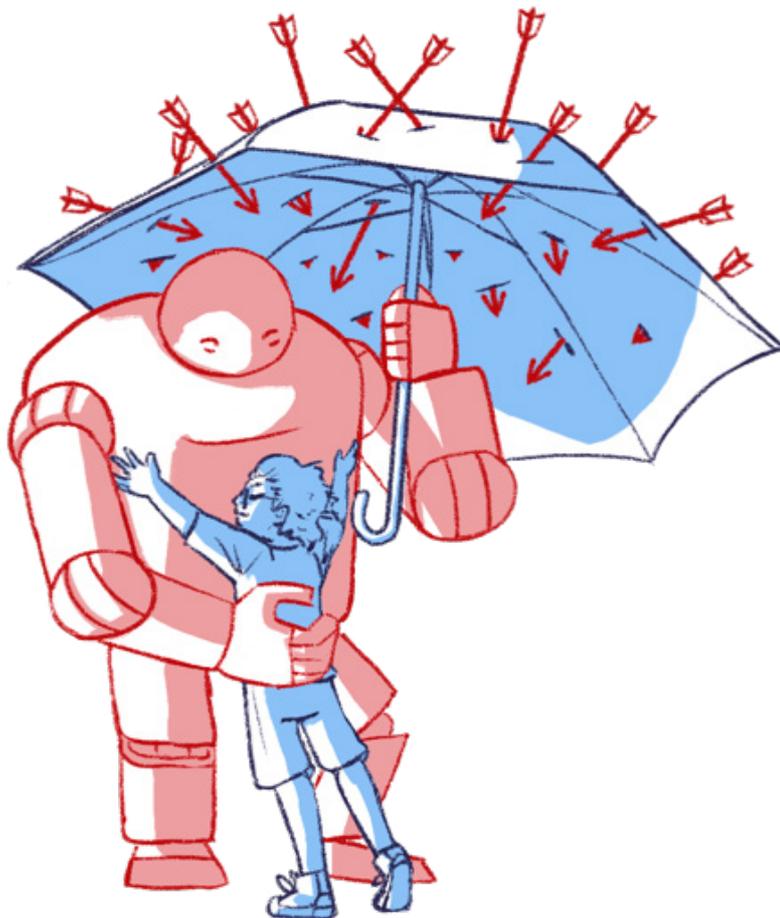
7. Educational institutions may automate basic administrative processes, and in the case of significant or complex decisions, may use algorithms to produce information to inform human decision-making. For instance, schools may employ machine learning and AI-based technology to [sort through student applications](#). How can we make sure that these systems do not (perhaps inadvertently, but systematically) exclude certain types of candidates if left unchecked and unsupervised? How can we ensure that students can understand how decisions are made about them to maintain their confidence in the system and institution?
8. How can we make sure that AI-based technologies used in sorting (e.g., through student applications), selecting, and hiring processes that attempt to classify applicants as prospectively successful (or unsuccessful) based on historical patterns, do not instead [identify and reinforce the biases](#) of their designers or available training data?
9. How do we make education around AI, in both formal and informal learning settings, accessible and engaging for young people — starting with an understanding of [data⁷/computational fluency](#)? Learning about and working with data is central in understanding the role of [big data](#) in AI machine learning systems and the core issues (e.g., biases embedded in data, lack of transparency in the data, etc.) surrounding these systems. Furthermore, how can we engage youth in conversations around the ethics of the design, development, and deployment of AI-based technologies,⁸ [inside](#) and [outside](#) of the classroom? Additionally, how can we [democratize access to education around AI and machine learning](#), particularly in the context of lower-income countries where many youth speak little or no English?

7 In the U.S., the National Council of Teachers of Mathematics recommends data analysis, probability, and statistics as mainstream strands in the k-12 curriculum, which is aligned with the [Common Core State Standards in mathematics](#) recently adopted by 42 states, Washington, D.C., and other regions of the U.S. Somewhat similar curricula around data analysis and statics has been implemented in primary and secondary grades in countries such as [Singapore, Norway, and New Zealand](#).

8 The [Digital Citizenship+ \(Plus\) Resource Platform](#) may be a helpful starting point for resources in this vein.

Recommended Readings

- [AI Grand Challenges for Education](#), Beverly Park Woolf, H. Chad Lane, Vinay K. Chaudhri, Janet L. Kolodner
- [The Future of Education: How A.I. and Immersive Tech Will Reshape Learning Forever](#), Lucas Rizzotto
- [Do We Really Want Computerized Systems Controlling the Learning Process?](#), Mitch Resnick
- [Embedded EthiCS: Integrating Ethics Broadly Across Computer Science Education](#), Barbara J. Grosz, David Gray Grant, Kate Vredenburg, Jeff Behrends, Lily Hu, Alison Simmons, Jim Waldo
- [\(Draft\) Beijing Consensus on Artificial Intelligence and Education: Outcome Document of the International Conference on Artificial Intelligence and Education 'Plan Education in the AI Era: Lead the Leap,'](#) United Nations Educational, Scientific and Cultural Organization (UNESCO)
- [Framing the Law & Policy Picture: A Snapshot of K-12 Cloud-Based Ed Tech & Student Privacy in Early 2014](#), Leah Plunkett, Alicia Solow-Niederman, Urs Gasser (for background on the cloud-based ed tech discussion)
- [Student Privacy and Ed Tech \(K-12\) Research Briefing](#), Leah Plunkett, Urs Gasser



2. Health and Well-being

Within the domain of health and well-being, AI-driven technologies – delivered, for instance, via mobile and web-based platforms, or on a larger scale, applied through public health interventions – have the potential to [facilitate diagnosis](#), [deliver targeted treatment](#), and [increase societal awareness around complex health issues](#). In the context of the youth population, current diagnostic AI tools allow clinicians to [assess suicide risk based on natural language processing](#), creating opportunities for earlier intervention and pathways of care for vulnerable youth. At the same time, AI-based diagnostic systems raise [concerns](#), particularly around privacy. Outside of the clinical setting, AI-powered technologies available through Internet-enabled devices, such as chatbots, can [deliver tailored mental health therapy to youth](#), allowing for increased user engagement and access to therapeutic services. At the broader community level, AI systems are able to promote awareness around major health problems, such as the human immunodeficiency virus (HIV), within high-risk populations. A recent innovation in the public health field, for example, uses AI technology to [select peer leaders within communities of homeless youth to increase awareness around HIV testing and preventative measures](#).



Emerging Questions

1. As AI holds the potential to predict, assess, provide therapy for, and mitigate diseases/health issues among youth, how do we reduce violations of privacy and ethics in which entities such as credit card companies or employers can [use AI to discriminate based on existing conditions or even pre-existing conditions](#)? (For more questions on privacy, see part III, section 2)
2. How can AI-based technologies be designed to reduce stigma around mental health service-seeking behaviors among youth – particularly youth from [communities where mental illness and treatment-seeking are highly stigmatized](#)?
3. In developing AI-based mental health diagnostic and therapeutic services, how can we make sure that these systems account for [cultural nuances](#) in how young people express mental and emotional distress? How can we also make sure that they consider child development issues?
4. How can AI systems – acting more as community connectors and educators (rather than direct problem solvers) – be applied towards other public health issues (beyond raising awareness around HIV testing and prevention), such as [prescription drug overdose](#), to better reach vulnerable youth?
5. How can youth trust AI without always fully understanding its functionality, and what are the implications of that “blind trust” in relation to [psychological and emotional well-being](#)?
6. How will AI voice-operated assistants shape youth’s social skills and push boundaries? Will young people become [more or less adept](#) at communicating with others?
7. How can we [involve youth themselves](#) in developing AI-powered technologies (e.g., chatbots) to deliver accurate health information to young people in an engaging, interactive way?

Recommended Readings

- [Artificial Intelligence-Assisted Online Social Therapy for Youth Mental Health](#), Simon D’Alfonso, Olga Santesteban-Echarri, Simon Rice, Greg Wadley, Reeva Lederman, Christopher Miles, John Gleeson, Mario Alvarez-Jimenez
- [Teenage Suicide Is Extremely Difficult to Predict. That’s Why Some Experts Are Turning to Machines for Help](#), Peter Holley
- [USC Researcher, and AI, Give Homeless Youth a Helping Hand with HIV Education](#), Joanna Clay
- [Advancement of Artificial Intelligence Opens Health Data Privacy to Attack](#), John Hickey
- [Alexa, Should We Trust You?](#), Judith Shulevitz

III. WORK, PRIVACY AND SAFETY, AND CREATIVITY AND ENTERTAINMENT

As AI-based technologies advance, especially those that can provide automation in the workplace, there is concern about how the labor market will be restructured. Indeed, a 2018 Pew Research Center [report](#) indicates that a majority of adults around the world are concerned about robots and computers taking over jobs currently performed by humans during their lifetime. The impact of these changes has the potential to be more acute for youth, as they tend to engage in work (e.g., retail and food services) that has a [high probability of automation](#). These developments could also exacerbate current [disparities in youth employment by race](#) and [geographies](#). Youth living in contexts characterized by service economies, low levels of educational attainment, and low levels of consumer demand will likely confront a [reduction of current employment opportunities](#).

AI will not only influence how youth work, but also how they play. Social technologies that collect large amounts of user data and video games that incorporate AI-powered characters are popular with youth (social media platforms, such as Facebook and Twitter, and video games such as *Rocket League* or *No Man's Sky*). These trends necessitate an understanding of how young people's data is being used – in the context of [play/leisure, education](#), and other domains – and how youth can effectively navigate privacy and safety concerns surrounding AI-driven technologies. Such developments also call for further efforts that give youth more [agency and knowledge](#) around AI-based systems in the context of playing, learning, and socializing.

1. Future of Work

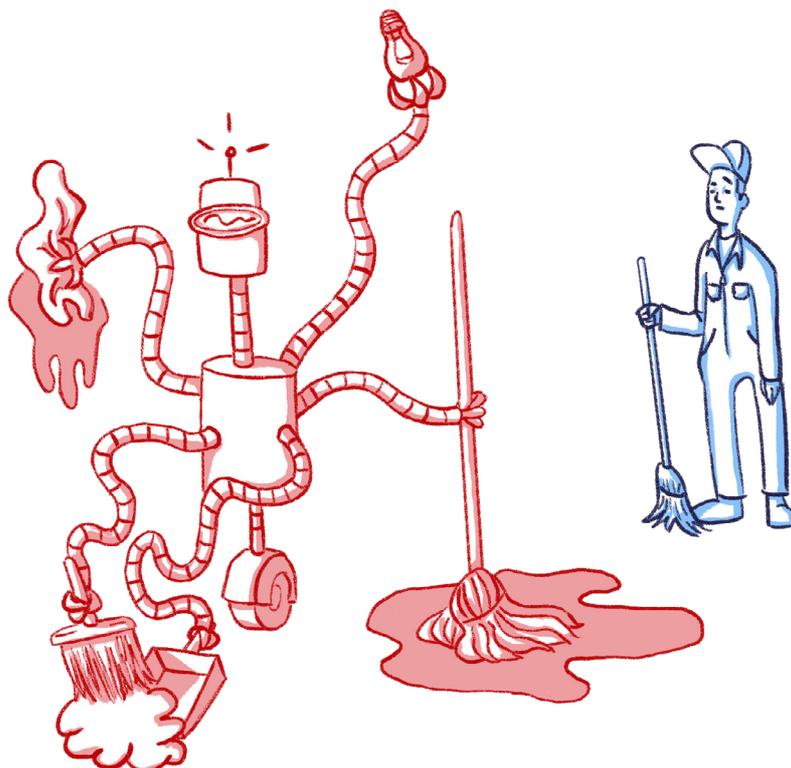
Technological innovation is radically transforming the labor market, with the [McKinsey Global Institute](#) estimating that between 400 to 800 million jobs worldwide could be automated by 2030. Advances in AI-powered technologies, however, are also opening up opportunities in [emerging jobs](#), creating a demand for new skills (e.g., around [coding, data/big data](#)) and "[uniquely human](#)" skills (e.g., empathy, creativity, community building) to thrive in this evolving occupational landscape. Against this backdrop, how can youth best prepare for the future labor market?

Emerging Questions

1. How can we most effectively equip youth, both through formal and informal learning spaces, with the skills to participate in the shifting occupational environment – not only technological skills (e.g., data analysis, programming) but also **increasingly important** higher-order cognitive skills (e.g., creativity, critical thinking) and social-emotional skills (e.g., empathy, adaptability, lifelong learning)? How can we create opportunities to retrain young people as the skills needed to thrive in today's society shift over time?
2. The **lack of diversity** in the AI industry begs the question: how do we encourage youth from underrepresented populations to explore and pursue careers in the field of AI, through **educational programming** and **informal learning**?
3. How will AI-fueled technologies shape young people's perceptions of potential future career pathways? What aspects of the future of work are they optimistic about and what are their concerns? How do those perceptions impact their psychological and emotional well-being? And how can we **include young people in the dialogue around the future of jobs** to better support them navigate the challenges and leverage the opportunities related to changes in the occupational landscape?

Recommended Readings

- [Jobs Lost, Jobs Gained: What the Future of Work Will Mean for Jobs, Skills, and Wages](#), James Manyika, Susan Lund, Michael Chui, Jacques Bughin, Jonathan Woetzel, Parul Batra, Ryan Ko, Saurabh Sanghvi
- [The Future of Jobs and Jobs Training](#), Lee Rainie, Janna Anderson
- [Developing a More Diverse AI](#), Stephanie Wykstra



2. Privacy and Safety

As today's youth are sharing large amounts of personal data with others, knowingly (e.g., using social media platforms, posting photos) and unknowingly (e.g., likes and shares; online shopping; and using mobile apps, sensors, and trackers), AI-based technologies – and their reliance on [big data](#) – raise serious privacy and safety concerns. The main objective of many AI systems is to make predictions and draw inferences about individuals and groups by algorithmically detecting patterns in large volumes of data. These predictions range from the relatively innocuous, such as [recommending YouTube videos based on viewing history](#), to the deeply personal, and potentially harmful, such as [substance abuse from Facebook users' status updates and likes](#).

In addition, AI-based technologies may lead to other types of privacy and security concerns that go beyond the predictions made by a given AI system. For example, massive amounts of data – big data – collected by an AI system could be accessed by unauthorized third parties and used for illegal, exploitive, and/or dangerous purposes – analogous to the [Cambridge Analytica scandal](#). Even decision-makers with authorized initial access to AI data might then make decisions based on the data that [limit youths' current or future opportunities](#). How can we most effectively equip young people to navigate the privacy and safety issues that surround AI-based applications? Are there safety and [privacy concerns](#) for youth that might require action on the part of non-youth stakeholders, such as lawmakers, regulators, or other adult decisionmakers?



Emerging Questions

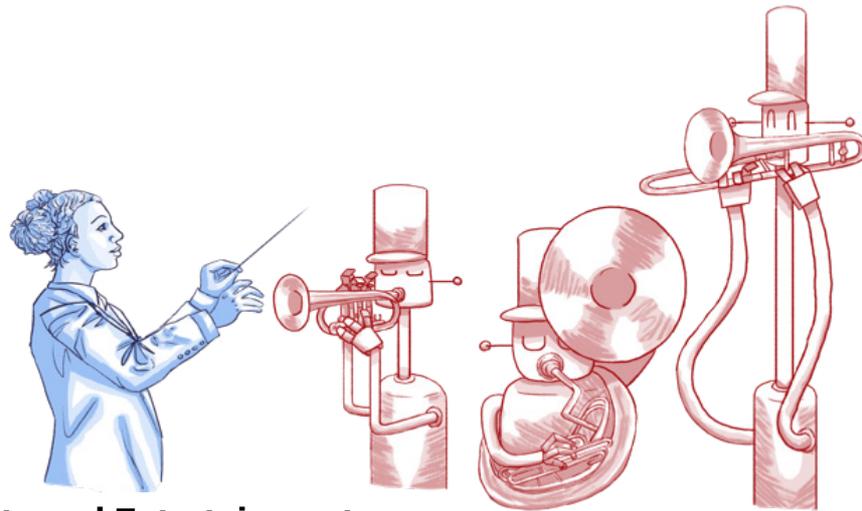
1. There are currently a variety of frameworks around the concept of digital citizenship addressing online privacy and safety that have helped drive educational reform (e.g., [Singapore's Cyber Wellness curriculum](#); [legislative initiatives within the U.S.](#) to require public schools to teach digital citizenship). As AI-powered technologies are changing how we think about issues surrounding privacy and safety in our digital world, how can we involve multiple stakeholders – including policymakers, educators, parents and caregivers, and youth themselves – in developing educational frameworks that address the interplay between AI systems and online safety and privacy?
2. What are the advantages and limitations of using voluntary or compulsory digital citizenship education as a means of empowering youth to understand and protect their own data privacy and security when interacting with AI?
3. How can we empower youth specifically to address disconnects between adult stakeholder decision-making and youth experience around privacy and security concerns in the context of educational technologies? For example, in the U.S., laws and regulations that frame youth digital data privacy typically place all or most authority around consenting to data collection with parents or guardians, rather than with youth themselves. In some circumstances (notably, education) consent to share youth data may be made by another adult party (the school) as a substitute for parental or guardian consent. Thus, with AI ed tech, youth find themselves with limited to no legal rights under federal law to consent or not consent to their private data being collected or used by the AI system. In these instances where concerns about privacy and security impacts on youth may arise, [which stakeholders might need to act, through what channels, and how might youth themselves have meaningful input?](#)



4. Facial recognition technology holds the potential to promote young people's safety (e.g., [helping to reunite missing children with their loved ones](#)) but poses serious privacy concerns through increases in surveillance, and, by extension, collection of personal data (e.g., [school-wide surveillance systems](#)). How can we reconcile our aim of collecting data with protecting the data of young users?
5. As youth are often at the forefront of adopting the latest digital technologies, will they be able to opt out of using some (though likely not all) AI systems? If not, how will they be informed about the short- and long-term [implications](#) these technologies may have on their lives?
6. How can AI be used to create richer social-emotional learning experiences for young people (e.g., through AI-powered characters in [virtual environments](#)), and the adults who teach them (e.g., educators, parents and caregivers), around society's most charged inclusion issues – such as immigration, police violence against vulnerable individuals, and hate speech? How can such experiences be created in a way that permits meaningful learning without youth having to fear negative consequences from engaging AI applications honestly? For instance, if a young person who lacks legal immigration status discloses this feature of her identity through an interaction with an AI designed to teach youth about immigrants' rights, how can her privacy be protected such that she does not need to fear governmental or other institutional action being taken against her as a result of this disclosure?
7. How can AI devices be used outside of the educational realm to promote equity for vulnerable youth while protecting their privacy? With so many youth living in poverty, facing violence in their neighborhoods, and experiencing many other difficult and dangerous circumstances, there is no end to the challenges that AI devices conceivably might help tackle. For example, could there be an AI system that provides safe and effective child care solutions such that single parents working multiple jobs to make ends meet would not need to leave their children home alone or in a substandard child care facility while [safeguarding children's privacy](#)? As innovators consider how to use AI in these and other equity-promoting ways, how can they avoid creating a false dichotomy between equity and privacy?

Recommended Readings

- [Children's Privacy in the Big Data Era: Research Opportunities](#), Kathryn C. Montgomery, Jeff Chester, Tijana Milosevic
- [AI Now Report 2018](#), Meredith Whittaker, Kate Crawford, Roel Dobbe, Genevieve Fried, Elizabeth Kaziunas, Varoon Mathur, Sarah Myers West, Rashida Richardson, Jason Schultz, Oscar Schwartz
- [Hey Alexa, What Can You Hear? and What Will You Do with It?](#), Sapna Maheshwari



3. Creativity and Entertainment

A variety of video games (e.g., [Overwatch](#), [Uncharted](#), and [Mario Kart](#)) currently feature AI-powered virtual characters that players can interact with as they navigate the gaming environment. Advances in gaming and other types of interactive digital platforms, however, are now moving youth from being consumers to producers of AI-driven content. In the online learning community Scratch, for example, young people have the opportunity to design AI-based [games](#), [simulations](#), and [chatbots](#). The creators of the video game Minecraft are [developing a youth-friendly platform that allows young people to train AI agents in the game's virtual world](#), helping youth better understand the inner workings of machine learning algorithms. In the future, AI-based technologies may allow young people to [work together with AI systems](#) to produce a variety of creative content, such as [music and art](#).

Emerging Questions

1. How can we extend and increase access to opportunities for [collaboration with AI systems](#) beyond gaming, appealing to the backgrounds and interests of a wide array of youth, in ways that promote young people's conceptual understanding of AI?
2. If [a trained human cannot tell the difference between the work of a great composer and the work of a machine](#), how will this affect young people's motivation to create their own artistic work? How will [AI's capacity to enhance human creativity](#) inspire young people to engage in creative work that leverages AI?
3. How will the increasingly interactive nature of AI-powered video game characters – which can lead users to feel as if they are part of a ["functioning social world"](#) – impact youth's interpersonal skills and social-emotional development?

Recommended Readings

- [How Do We Define Creativity?](#), Ian Sample, Jordan Erica Webber
- [There Will Always Be Limits to How Creative a Computer Can Be](#), Tony McCaffrey
- [Deep Learning Is Not a Replacement for Human Creativity, Period](#), Ben Dickson
- [Drones & Dreams: A Speculative Sprint Story Collection](#), Edited by Amy Johnson, and produced by Malavika Jayaram (Digital Asia Hub)

SPOTLIGHT
SERIES

Youth and the Digital Economy:

EXPLORING YOUTH PRACTICES, MOTIVATIONS,
SKILLS, PATHWAYS, AND VALUE CREATION

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Bluebook

Andres Lombana-Bermudez, Sandra Cortesi, Christian Fieseler, Urs Gasser, Alexa Hasse, Gemma Newlands, and Sarah Wu. YOUTH AND THE DIGITAL ECONOMY: EXPLORING YOUTH PRACTICES, MOTIVATIONS, SKILLS, PATHWAYS, AND VALUE CREATION (2020), available at <https://cyber.harvard.edu/publication/2020/youth-and-digital-economy>

KEYWORDS

Youth, young people, children, adolescents, teenagers, education, high school, middle school, digital media, new media, Internet, ICT, Web, online, digital economy, capital-enhancing activities, aspirational labor, hope labor, virtual collaboration, skills.

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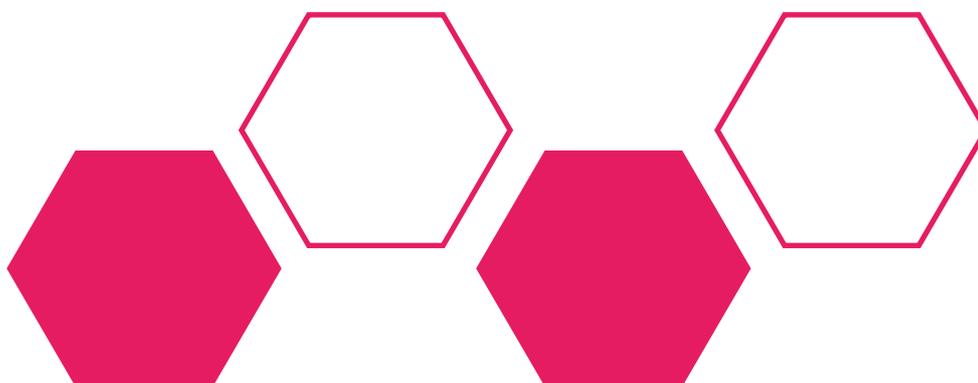
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Youth and the Digital Economy: Exploring Youth Practices, Motivations, Skills, Pathways, and Value Creation

By Andres Lombana-Bermudez, Sandra Cortesi, Christian Fieseler, Urs Gasser, Alexa Hasse, Gemma Newlands, & Sarah Wu.

Young people's lives are increasingly shaped by digital technologies. While significant digital divides and participation gaps remain, an increasing number of young people around the globe participate in and contribute to the digitally networked environment in many forms, ranging from creative expression on social media to interactive gaming and collaboration. This spotlight explores young people's digital engagement through the lens of the digital economy and seeks to gain an initial understanding of youth's practices, motivations, skills, pathways, and modes of value creation as they interact with a digital environment in which the boundaries between the commercial and personal spheres, between work and play, are often blurring. The spotlight summarizes key insights from a trans-Atlantic exploratory research collaboration between Youth and Media at the Berkman Klein Center for Internet & Society at Harvard University and the Nordic Centre for Internet and Society at BI Norwegian Business School. In addition to sketching building blocks toward a framework, the paper brings together three essays that explore in different application contexts both the opportunities and challenges that surface when young people engage with and participate in the digital economy.



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0. BACKGROUND AND PURPOSE



Young people’s lives are increasingly shaped by digital technologies. While significant digital divides and participation gaps remain, an increasing number of young people around the globe participate in and contribute to the digitally networked environment in many forms, ranging from creative expression on social media to interactive gaming and collaboration. This spotlight explores young people’s digital engagement through the lens of the digital economy and seeks to gain an initial understanding of youth’s practices, motivations, skills, pathways, and modes of value creation as they interact with a digital environment in which the boundaries between the commercial and personal spheres, between work and play, are often blurring.

The spotlight is divided into two segments. Segment one provides an introduction to the evolving discourse around youth and the digital economy. It starts with a brief overview of different types of youth-engagement opportunities associated with the proliferation of the Internet, widespread adoption of mobile devices, and emergence of interactive platforms that are at the core of today’s digital economy. Moving from opportunities to challenges, segment one then addresses the problem of existing digital divides, as well as the risk of new structural inequalities and participation gaps and also points toward new power asymmetries between youth as users/producers/consumers and powerful commercial platforms. It concludes with 12 areas of interest emerging from this project that deserve further investigation and might inform a future research agenda.

Segment two of the spotlight includes three in-depth essays that further explore in specific application contexts and from different perspectives the opportunities and challenges that emerge when young people engage with and participate in the digital economy. One essay examines youth-driven capital-enhancing activities such as creating and sharing content on social media platforms. A second essay examines how young people leverage their online activities and skills with an eye to future employment opportunities — a phenomenon termed “aspirational labor.” A third essay uses a case study to zoom in on so-called “soft” skills — such as virtual collaboration skills — and examines how such skills might prepare young people to thrive in the digital economy as a highly networked ecosystem.

The spotlight summarizes key insights from a trans-Atlantic exploratory research collaboration between Youth and Media at the Berkman Klein Center for Internet & Society at Harvard University and the Nordic Centre for Internet and Society at BI Norwegian Business School. It seeks to provide initial conceptual building blocks and phenomenological insights toward a more comprehensive analysis and assessment of youth’s engagement in the digital economy and the opportunities and challenges that are associated with it.

I. FRAMING AND CONTEXT



1. YOUTH ENGAGEMENT OPPORTUNITIES

The Internet and digital technologies that run on top of it have unleashed an explosion of creative opportunities for youth to be active in a “participatory” and “networked” culture, with low barriers to entry and multiple possibilities for widespread content circulation (we will address some of the roadblocks in the following sections). Youth can share information and communicate their knowledge, connect with interest-driven communities (e.g., video game modding forums), and cooperate on peer-based production projects (e.g., by contributing to multiple animator projects

on Scratch or engaging in collaborative fan-fiction projects), among other productive activities (Benkler, 2006; Jenkins, 2006; Jenkins et al., 2006; Ito et al., 2011). A rich body of theoretical work and empirical research suggests that youth engagement with online content, platforms, and services can take many forms (Palfrey & Gasser, 2016). Some of these newer forms of engagement build upon and complement more traditional forms of content creation. For further illustration, consider the following modes of engagement and anecdotes.



Video Blogging:

Particularly powerful examples of youth participation in the digital economy are influencers on YouTube, where tech- and business-savvy young people have built popular personal brands by creating beauty and lifestyle videos that emphasize their cultural and racial specificity, aesthetics, values, and norms. With thousands, sometimes millions, of viewers and subscribers, some YouTubers have become influencers who earn money by displaying third-party advertising on their content (e.g., the Google AdSense program) or by partnering with companies to create videos about specific products and services (“advertorials”).

Written Blogging:

Written blogs continue to be a site of production and consumption for youth, both on personal websites and social media platforms such as Tumblr. Given the evolution of social media ecosystems, blogs are usually maintained in coordination with YouTube and Instagram channels, as well as Facebook pages. Common examples of youth blogging are fashion blogs, where young creators cultivate niche audiences based on particular styles. Besides maintaining and expanding connections with readers, they sometimes generate revenue through affiliations with established fashion brands that sponsor posts about particular products.



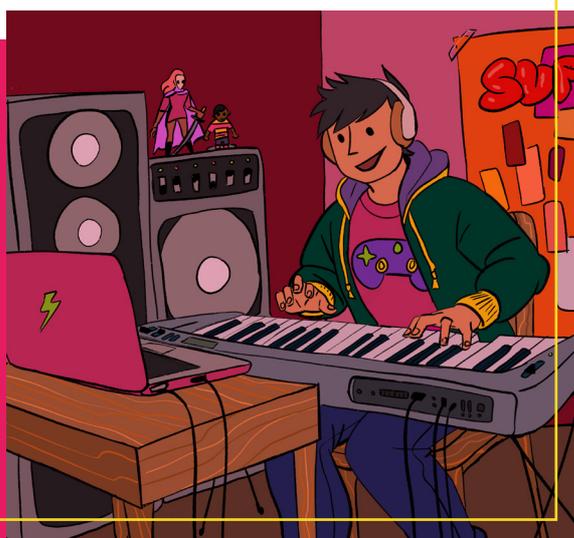
Photography / Art / Design:

Youth, who are passionate about food, nature, fashion, art, and/or design, have also become avid contributors on social media (e.g., Instagram and Snapchat) by posting pictures and photographs of their passions online, building audiences of followers. For example, 17-year-old Jose from Peru, publicly known by the name *@naturally.jo* on Instagram, started his path in the digital economy by posting vegan art and food. Following a common trajectory, he then later expanded his content production and circulation to other platforms, such as YouTube and Facebook, where he continues to build relationships with his audience.



Music / Podcasting:

In the music sector, some young people have been able to build global audiences of listeners, sometimes counting into the thousands, for their original music on SoundCloud. In doing so, these young people often find opportunities to distribute their music, perform in public venues, and crowdfund the production of their albums. Music genres such as “SoundCloud hip hop” in the U.S., baile funk in Brazil, and rap urbano in Colombia have grown in recent years due to the creative exchanges, exposure, and community relationships developed by minority youth online. For instance, a group of low-income Afro-descended male youth from Colombia and Brazil or African-American youth from the U.S., have been gaining popularity on SoundCloud by uploading their music tracks, networking with other artists, and connecting to producers and promoters online.



Coding / “Modding:”

Other young people – often teenagers from more privileged backgrounds – participate in the digital economy through their engagement in gaming culture. Massive Multiplayer Online Games (MMOGs), such as Roblox, provide not only a virtual world where players engage in a variety of adventures, but also virtual studios and markets where youth can create, test, and commercialize their own games.



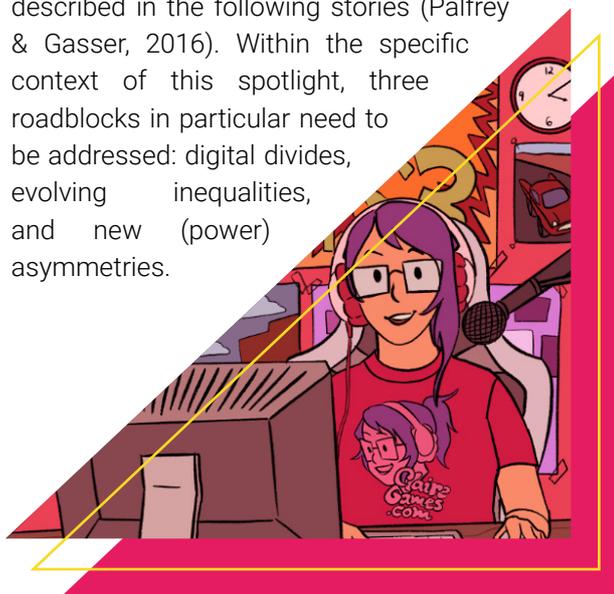
Moreover, skilled teens engage in “modding,” which is the practice of transforming existing commercial video games and developing additional content for public consumption. These modders can thus build their reputations as skilled game designers, hoping to eventually be hired in the professional gaming industry.

These forms of engagement describe a spectrum of what is possible. Granted, while social media platforms may enable youth to express themselves in many different ways, the majority of young users tend to engage in relatively modest ways (i.e., sharing a few pictures on Instagram or some snaps on Snapchat). Surveys confirm it is a relatively small number of young people who extensively post content and heavily invest in creating ambitious projects online. It is important to recognize these facts, as further discussed in the next section on digital divides and evolving inequalities. That being said, it is equally important to appreciate the extent to which all modes of engagement, including modest engagement, represent opportunities for learning, identity formation, belonging, and individual autonomy. Furthermore, what may seem mundane in isolation, such as a selfie on Instagram, may affect societal changes in sum and over time. For all these reasons, the adult-normative perspective should arguably be less focused on a given level of engagement and creativity of an individual expression but shift toward the question of how to best encourage youth to engage in different ways – whether with pen and paper or through the latest digital technologies.

Whether their individual contributions are small or big, youth engagement online has helped to create a digital environment that is more diverse in terms of voices, perspectives, and information. Diversity, in turn, enables people to access a wider range of viewpoints. It allows people (young and old) to have conversations based on different ideas and creative expressions. It also helps drive participation in public discussions and matters from a broader cultural perspective. A diverse body of art and literature, varying lifestyles and ways of living together, and different cultures, languages, value systems, traditions, and beliefs make our lives more interesting compared to a world full of constraints on creativity and expression.

Another important consequence of an emerging digital economy is the profound effect it has had on youth and their ability to be more entrepreneurial and part of different business ventures. Having a creative idea, the relevant skills, and some social, cultural, and financial capital can, in many cases, lay the groundwork for more entrepreneurial endeavors. This cultural shift also becomes more apparent in the

growing popularity of “makerspaces,” or community spaces centered around creativity, innovation, and group collaboration among youth. While this existing entrepreneurial mindset among youth is promising, significant participation gaps and barriers remain that hinder and sometimes even prevent youth from engaging in digital activities of the sort described in the following stories (Palfrey & Gasser, 2016). Within the specific context of this spotlight, three roadblocks in particular need to be addressed: digital divides, evolving inequalities, and new (power) asymmetries.



2. DIGITAL DIVIDES AND EVOLVING INEQUALITIES

Over the past two decades, scholars have acknowledged the risk that the digital transformation of societies could exacerbate and reproduce existing inequalities, creating a “digital divide” of multiple dimensions (DiMaggio et al., 2004; Norris, 2001; Warschauer, 2002), which could, in turn, also affect the degree to which young people can participate in the digital economy.

The digital divide is multifaceted – inequities can come in the form of unequal access to technologies (first-level digital divide); unequal development of the relevant skills needed to flourish online (second-level digital divide); and the disparate benefits of technology usage according to socioeconomic status (third-level digital divide) (Lombana-Bermudez, 2017; Pearce & Rice, 2017).

1. The “first-level digital divide” describes the baseline divide – the gap in access to the

Internet (Lombana-Bermudez, 2017; Pearce & Rice, 2017). The Broadband Commission for Sustainable Development reported that in 2017, 52% of the world’s population still does not have access to the Internet or their access is intermittent or of inferior quality (UNICEF, 2017). Internet-user penetration is vastly different depending on geography. For example, close to 90% of the young people (aged 15–24) currently not using the Internet live in Africa or Asia and the Pacific (International Telecommunication Union [ITU], 2017). The participation gap is also evident between those living in rural and urban areas across the globe, even in highly connected countries, as demonstrated by the OECD (2018).

2. The “second-level digital divide” describes gaps in terms of online skills and practices (Hargittai, 2002; Jenkins et al., 2006). For example, successful social media influencers have developed sophisticated skills to game the algorithms and maximize exposure of their content. Meanwhile, other youth may be participating in the digital economy in a less “advantageous way” – that is, with little impact on their social status – such as through passive consumption of media or entertainment, without an eye toward future benefit. The difference in the online activity of those in the Global North compared with those living in the Global South is pronounced. This “participation gap” is primarily driven by barriers to access to infrastructure, affordability issues, and lack of relevant local content (Broadband Commission for Sustainable Development, 2017).

3. The “third-level digital divide” describes how individuals with higher socioeconomic status benefit more from online engagement than those with lower socioeconomic status (van Deursen & Helsper, 2015; van Deursen & van Dijk 2013; van Dijk, 2005). Although there is a lack of empirical evidence that focuses specifically on content produced by young people, scholars have long recognized there is a digital content-production gap amongst adults that is driven by socioeconomic status (Schradie, 2011) and other factors, like race (Mack, 2001) and gender (Liff et al., 2004). For example, youth from the lowest-income countries use the Internet the least (UNICEF, 2017). Also, particularly in some low-income countries, men use the Internet more than women, with this gap widening over time (ITU, 2016; UNICEF, 2017).

Taken together, it becomes apparent that even though young people as a demographic have a high level of connectivity, they are not all participating under the same conditions. Instead, the playing field is unequal across multiple dimensions, such as geographic location, the education level of parents, social class, race, and gender. The expected result is that the benefits of connectivity will accumulate in the hands of those youth who are already well-positioned to



reap the rewards. Conversely, the rising inequality is limiting access to opportunities and social mobility (Hargittai 2010; Margolis, 2008; Putnam, 2015; Watkins et al., 2018), both within the U.S. and beyond. For example, worldwide, girls aged 5–9 and 10–14 spend 30% and 50% more of their time, respectively, on household chores than boys of the same age (UNICEF, 2018). This adds up to valuable time that is not spent on other capital-enhancing skills, including the development of digital skills.

3. NEW ASYMMETRIES

Even for youth who are in a position to bridge the digital divide and have access to technology and the skills to engage in the digital economy, new power asymmetries emerge that, knowingly and unknowingly, shape young people's online experiences.

Consider, for instance, social media platforms (e.g., Facebook, Instagram, and Snapchat), online video services (e.g., YouTube, Netflix, and Amazon Prime Video), instant messaging systems (e.g., WhatsApp, Facebook Messenger, and Skype), and games that are tremendously popular among youth. Most of these platforms and services are commercial spaces with advertising-based revenue models. This means that they provide “free” services on which youth can socialize, communicate, learn, and play. In return, however, youth indirectly pay for these services by being the recipients of targeted ads. In order to be able to better target these ads, the platforms and services collect, aggregate, and analyze the massive amounts of data youth generate about themselves (and in many cases, their friends and connections) as they navigate through these online environments. This process transforms young people and their data into something that can be sold to advertisers and analyzed for marketing purposes (Cohen, 2017; Couldry & Mejias, 2018; Posner & Weyl, 2018; Wu, 2016; Zuboff, 2015).

Given these existing disparities in access to technology, skill levels, and the reasons behind its use, the evolution of the digital economy is likely to deepen structural socioeconomic, racial, and gender inequalities in the absence of policy and design interventions that cover a broad range of digital transformation issues, including infrastructure investments, educational interventions, and equal opportunity programs, to name a few examples.

The concerns associated with the current approach of the digital economy and its powerful platforms are manifold. In the context of this spotlight,¹ three power asymmetries are particularly noteworthy.

1. Young people are not often fully aware of the extent to which their data — whether given (e.g., pictures, videos, and other content shared), left behind (e.g., collected via cookies), or inferred (Livingstone, Stoilova, & Nandagiri, 2018) — is being collected, aggregated, and analyzed by platforms and services. For instance, focus group interviews have shown that young users care about privacy vis-a-vis other users such as peers, parents, or teachers (i.e., interpersonal contexts) and have developed nuanced strategies to manage their reputation. However, these interviews have also shown that young users are less aware of, and in some cases and/or contexts, less concerned about (Common Sense Media, 2018), the commercial data practices (and underlying business models) that are deployed by social media platform providers (Palfrey & Gasser, 2016). For instance, focus groups indicate there is little awareness among youth what a “like” on a product page on Facebook means in terms of collection of personal information (Palfrey & Gasser, 2016).

¹ The three power asymmetries are not youth specific. Adults are not invulnerable to the exact same issues.

2. Platforms and services profit from young people's data, attention, culture, labor, and creativity. Yet, the benefits are not equitably shared. Some Internet scholars have argued these online activities are a form of unpaid labor that is exploited by commercial platforms and services (Andrejevic, 2009, 2013; Cohen 2017; Fuchs, 2010, 2013; Fuchs & Sevignani, 2013; Scholz, 2008; Terranova, 2000). As Posner and Weyl (2018) explain, this "data work" is the source of the record profits of the most valuable companies in the world. Most "people do not realize the extent to which their labor — as data producers — powers the digital economy" (Posner & Weyl, 2018, p. 208).
3. Research findings suggest that young people have started to use different platforms and services based not only on technical affordances, but also as a way to segment audiences, calibrate the reach of their communication, and ultimately manage their reputations (Cortesi & Gasser, 2015; Kanchinadam et al., 2018; Palfrey & Gasser, 2016). However, many of the most popular platforms belong to the same parent companies, with extensive data collection and sharing across these services, as well as with data brokers and

large advertising networks. As a result, youth who do not want to share their data with these platforms and services lack alternate options. Deciding not to share would in most cases mean not using digital platforms and services at all, which is often not a viable option given the important role they play in young people's lives (Anderson & Jiang, 2018a; Anderson & Jiang, 2018b; Palfrey & Gasser, 2016).

Taking these elements together, youth are growing up immersed in a digital platform ecosystem where they participate in a variety of paid and unpaid economic transactions, consuming and producing content, while exposing themselves to an intense flow of advertising. In other words, online platforms have a paradoxical and contradictory relationship with youth that is shaped by the logic of a data-driven business model. On the one hand, youth are empowered by the digital ecosystem because they are provided with the tools and spaces to exercise their agency as active and creative consumers and producers of culture. At the same time, corporate platforms commodify their data, attention, culture, labor, and creativity for profits that are not equitably shared.

4. INTRODUCING THE ESSAYS

In this spotlight, we present three in-depth essays to explore — in specific application contexts and from a phenomenological, analytical, and normative perspective — the various opportunities and challenges that emerge when young people engage with and participate in the digital economy.

The first essay, "Youth and Capital-Enhancing Activities," examines capital-enhancing activities such as creating and sharing content on social media platforms. By expanding on the traditional notion of "capital" as purely economic capital, the essay demonstrates that online activities can also lead to valuable increases in social and cultural capital. Story #1² introduces some of these key themes.



² In each of the three stories in this section (Story #1, Story #2, and Story #3), please note that the users and social media accounts referenced are based on real-world individuals, but have been given pseudonyms.

STORY #1

MIRAY AND HER LOVE FOR VEGANISM

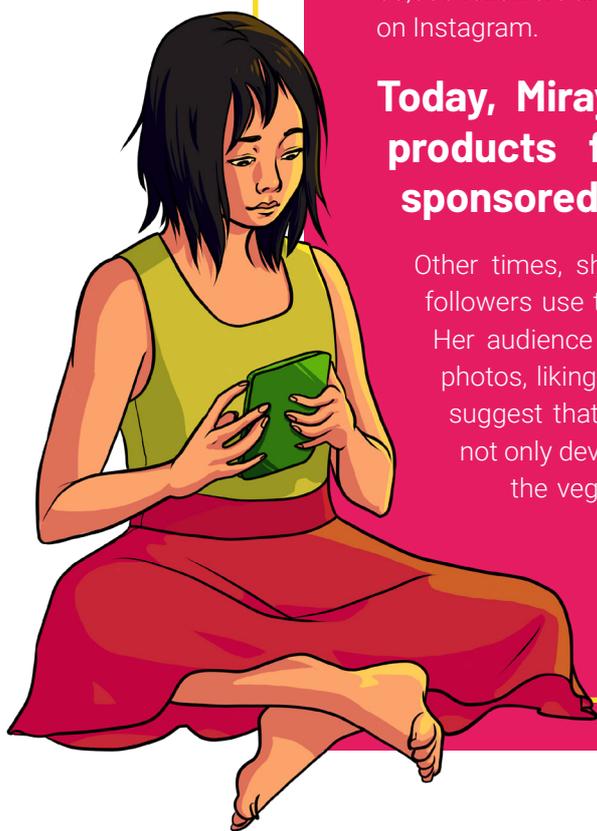
Featured in Essay 1 – “Youth and Capital-Enhancing Activities”

Miray, a young vegan (18) from Chicago, discovered veganism on the Internet three years ago while attending high school. She identified with the movement’s core values of animal protection, environmental sustainability, and health improvement and decided to take up a vegan lifestyle. Although her family ate meat, she was able to pursue her choices thanks to the financial support of her parents and a network of vegans she was able to connect with online. She researched vegan websites, joined Facebook groups, and followed vegan YouTubers and Instagrammers, all in order to learn about foods, recipes, and the many aspects of being vegan.

During her first year in college, Miray started to publish high-quality photos of the meals she cooked on an Instagram account she created for this purpose (@VeganMiray), using the camera of a new smartphone (iPhone) her parents bought her. When posting the photographs, she added a caption describing the recipe and the foods she used, including various hashtags (#recipe #vegan #recipes #cooking #plantpowered #vegansofig #veganfoodshare #whatveganseat #veganfood #crueltyfree #eatclean #healthyfood #dairyfree #veganfoodporn #veganism). Using the @VeganMiray account, Miray followed her favorite vegan Instagrammers as well as some of her high school and college friends. Soon, @VeganMiray captured the attention of other vegans on Instagram that liked, commented, and re-circulated her photographs. In a few months, @VeganMiray had an audience of almost 50,000 followers and the status of an influencer among the vegan community on Instagram.

Today, Miray sometimes makes recipes using products from food companies that have sponsored her @VeganMiray Instagram posts.

Other times, she shares discount codes to online websites — if her followers use the code to buy vegan goods, she earns a commission. Her audience of followers engage frequently with the @VeganMiray photos, liking and commenting on photos and tagging other users to suggest that they try the recipes. Miray, therefore, has been able to not only develop a reputation and cultivate a growing network among the vegan community on Instagram, but has also been able to earn money through the sponsorship of companies. She has started to work on a book about vegan recipes



STORY #2

based on the ones she posts online and, motivated by the followers of @VeganMiray, hopes to publish it soon.

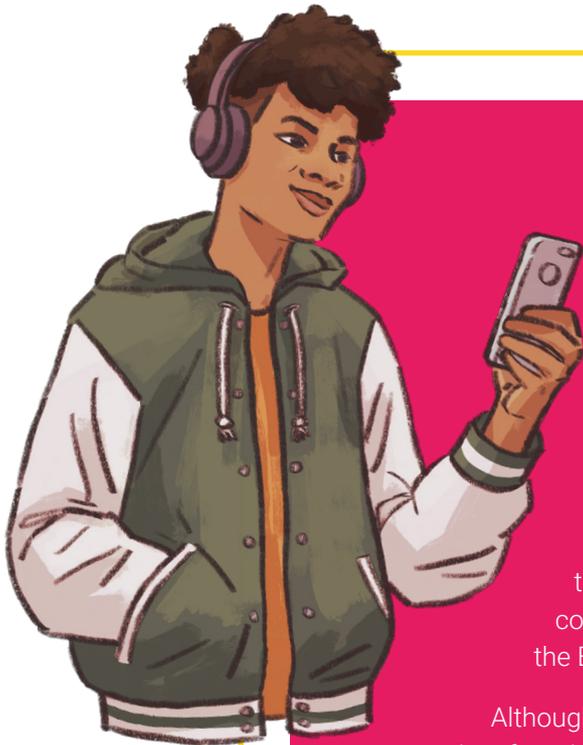
The second essay, “Aspirational Labor,” examines the phenomenon of young people leveraging their online activities and skills with an eye to future employment opportunities in desired industries (Duffy 2015, 2017). The example discussed in the essay is about bedroom music production and sharing on SoundCloud. It explores how young people negotiate long- and short-term gains as they engage in economically oriented online activities, and the risks and opportunities that youth confront as they engage in aspirational labor. Consider the following Story #2.

NICK AND HIS MUSIC PRODUCTION

Featured in Essay 2 – “Aspirational Labor”

Since he was 16 years old and a freshman in a public high school in Miami, Nick has published the video game music he produces at home on the Internet. Using a personal laptop computer, headphones, a MIDI keyboard, and the broadband connectivity his parents have provided for him, Nick has been able to pursue his passion for video game music production, and works hard to curate an online music portfolio where he can showcase his creations.

Initially, he uploaded his music to SoundCloud, a specialized online audio-sharing platform, where he followed several aspiring and professional video game musicians and sound designers. On SoundCloud, Nick actively listened, favorited, and commented on the music shared by others. Although for the first few years his tracks and profile had low listener and follower counts, he spent lots of time and energy on SoundCloud examining other musicians’ productions, asking questions, and learning about the different styles and subgenres of video game music. Three years after joining SoundCloud, Nick assembled a portfolio showcasing 10 video game soundtracks and three playlists, amassed almost 300 followers, and some of his tracks were listened to thousands of times.



With the support of his parents, Nick, now 20 years old, is attending a college of music in Boston. He continues to publish video game music he creates on SoundCloud and still spends time commenting on the work of other musicians. However, he dedicates most of his time to schoolwork and composing music for indie game projects he releases with Share-alike Creative Commons licenses. The indie game community — both online and offline — has provided him with a fertile space for collaboration on projects. Sometimes he gets contacted by indie game developers through his SoundCloud profile, and other times he meets collaborators at the monthly meetings and game jams in the Boston indie games community.

Although Nick has not been paid for his music production yet, he has found several opportunities to make video game music, expand his portfolio, express his creativity, and learn about other aspects of music production such as sound mixing and voice recording. He hopes to become a professional video game music producer and sound designer and expects to get paid for his work soon. He believes he has built a robust digital portfolio online and has connected with a network of indie game developers that will help him find paid job opportunities and projects with larger budgets that can cover his music production costs.

Nick's portfolio is an example of aspirational labor, where an economic actor produces some kind of output in hopes of later receiving social or monetary compensation, with an uneven reward structure. As cultural shifts toward creative professions and entrepreneurship encourage young people to enter nontraditional job hierarchies, aspirational labor has become increasingly prevalent, especially in digital spaces. Blogging, Instagramming, video game modding, and Nick's own music production are all examples of current activities that youth commit to in order to later make profit, either by cultivating a body of work or gaining social traction.

The third essay, "Virtual Collaboration", touches on the "soft" skills (as opposed to technical "hard skills") considered necessary to thrive in the digital economy as a highly networked ecosystem. This skill of "virtual collaboration" involves working with people from a variety of backgrounds and cultures and is discussed through the example of a collaborative project on Scratch, an online community for creating and sharing interactive multimedia projects. The following Story #3 introduces some of the key themes covered in the essay.

STORY #3

ASH AND HER COLLABORATION ON SCRATCH

Featured in Essay 3 – “Virtual Collaboration”

On July 6, 2016, Ash (15), a teenager from the U.S., shared the project “Hands – Open MAP (Multiple Animator Project) – For Orlando” (“Hands for Orlando”) on Scratch. This was the fourth MAP that Ash hosted on Scratch. Despite being relatively new to the Scratch community, Ash had earned a reputation as a talented creative programmer, animator, and MAP host, and had cultivated a network of more than 1,000 followers.

Ash framed the “Hands for Orlando” project as a tribute to the victims of the shooting at the Pulse Nightclub in Orlando, Florida on June 12, 2016. The MAP had a clear civic theme related to diversity, peace, tolerance, and lesbian, gay, bisexual, transgender, and queer (LGBTQ) equality. When describing the rules in the project’s “Notes and Credits” section, Ash stated, “This MAP is honoring the victims of a terrible tragedy.”

The project was inspired by the charity single “Hands” written by Justin Tranter, Julia Michaels, and BloodPop and recorded by 24 famous artists, including Britney Spears, Jennifer Lopez, and Pink. The song was made available to the public as a digital download on July 6, 2016 – the same day that Ash published the invitation to participate in the “Hands for Orlando” project on Scratch.

Ash worked quickly to spread the word among the Scratch community, establish project goals, and assign tasks to contributors. A total of 37 animators – spread across the U.S., Canada, and the U.K. – joined the “Hands for Orlando” project, choosing different parts of the song and creating short 10-second animations for each segment. Ash, as the MAP host, was in charge of collecting all animated segments, stitching them together, and assembling the completed animation. On September 16, 2016, Ash published the final product on the Scratch website and created a video of the project that he shared on YouTube.

This case study of Ash demonstrates the range of skills that youth are developing to succeed in the digital environment. The essay explains how the success of “Hands for Orlando” was due to Ash’s ability to virtually collaborate with peers. Decades of research has identified that collaboration is a key interpersonal skill critical to academic, occupational, and personal success. Virtual collaboration shares many aspects of collocated collaboration but also brings unique challenges. In this essay, drawing upon the Hands for Orlando MAP, we illustrate how effective virtual collaboration is built upon three key levers: effective leadership, trust-building, and establishing common ground.

The essays may be read as stand-alone papers or considered as part of a broader collection of works exploring youth engagement in the digital economy. It is the hope of the collaborators that additional

essays and case studies are added to this collection as our research progresses, informed by the initial research agenda outlined in the next section.

5. A POSSIBLE RESEARCH AGENDA

Based on the research conducted so far and our ongoing work with young people, discrete research areas have emerged that can provide a motivating framework for future investigation into the roles of young people in the digital economy. Each of these research areas provides short glimpses into the lives of young people and their practices, motivations, mindsets, abilities, and skill development needs. These research areas also highlight different observable structural inequalities, such as the imbalanced power relationships between platforms and users or youth being in a position of relative disempowerment when competing against adults for market share.

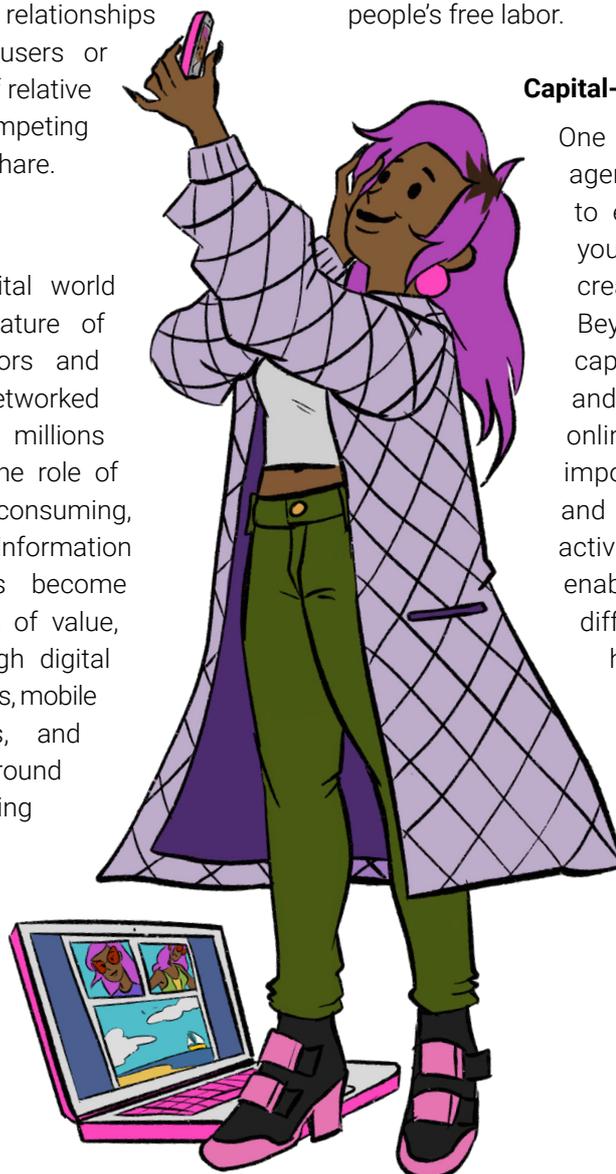
Youth as “Prosumers”

Advances within the digital world have transformed the nature of youth as economic actors and agents. As the digitally networked environment evolves with millions of young people online, the role of youth in creating, sharing, consuming, curating, and searching for information and cultural goods has become central for the generation of value, data, and content. Through digital technologies (e.g., computers, mobile phones, laptops, tablets, and game consoles), youth around the world are encountering opportunities to act as consumers, producers and users. The term “prosumer” combines the word “producer”

with “consumer” to describe the new duality (Toffler, 1980; Tapscott, 1995). “Prosumerism,” however, raises many issues for further exploration, such as the long-term effects of youth exposure to hyper-consumerism and hypercapitalism, the feasibility of youth competing with commercial content producers who control resources that enable high-quality production, such as capital and technical expertise, as well as the exploitative relationship of corporate entities, such as platforms, profiting from young people’s free labor.

Capital-Enhancing Activities

One way to understand youth agency in the digital economy is to examine the ways in which young people’s online activities create different forms of capital. Beyond earning economic capital, youth may develop social and cultural capital through their online engagement, which is also important for their development and status. By focusing on activities and practices that enable youth to cultivate these different forms of capital, we hope to better understand how youth – particularly, those who are negatively impacted by disparities across gender, race, and social class – may be empowered to engage in capital-enhancing activities.



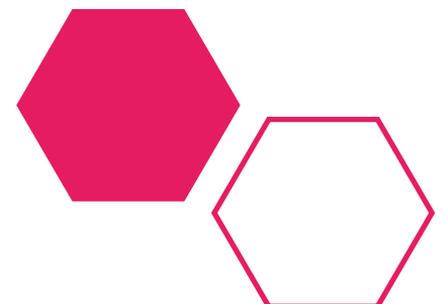
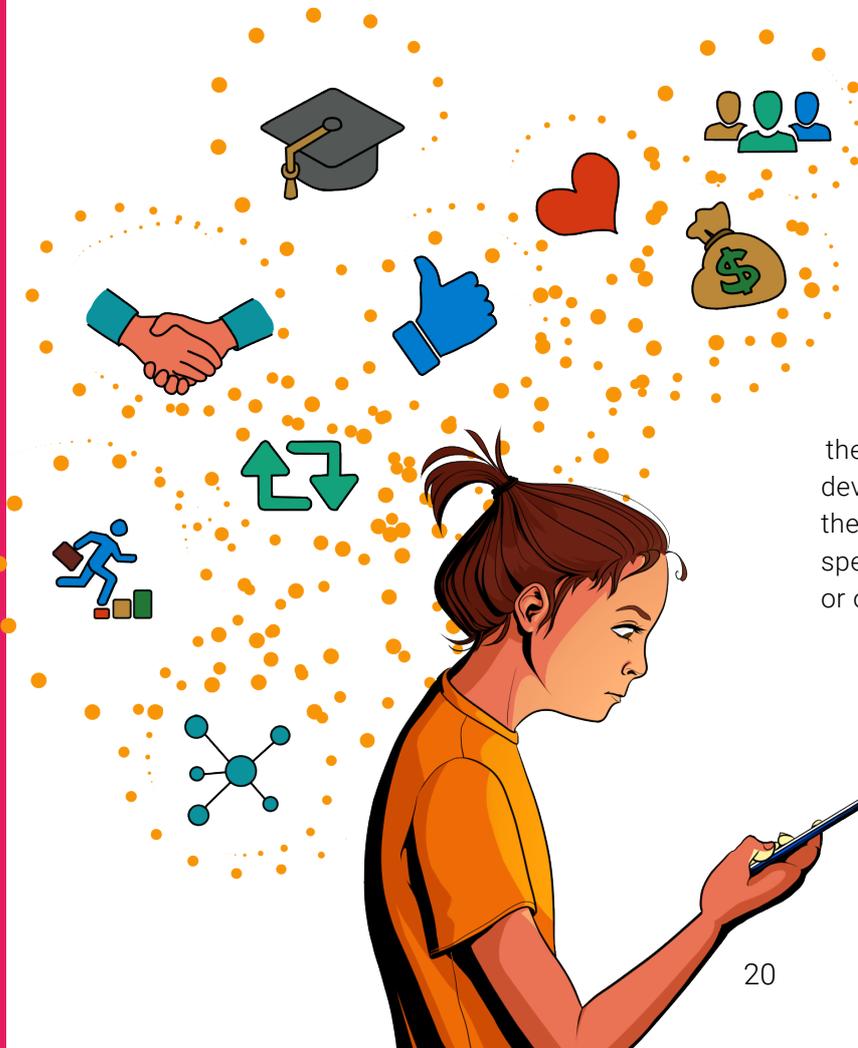
Intrinsic and Extrinsic Motivations

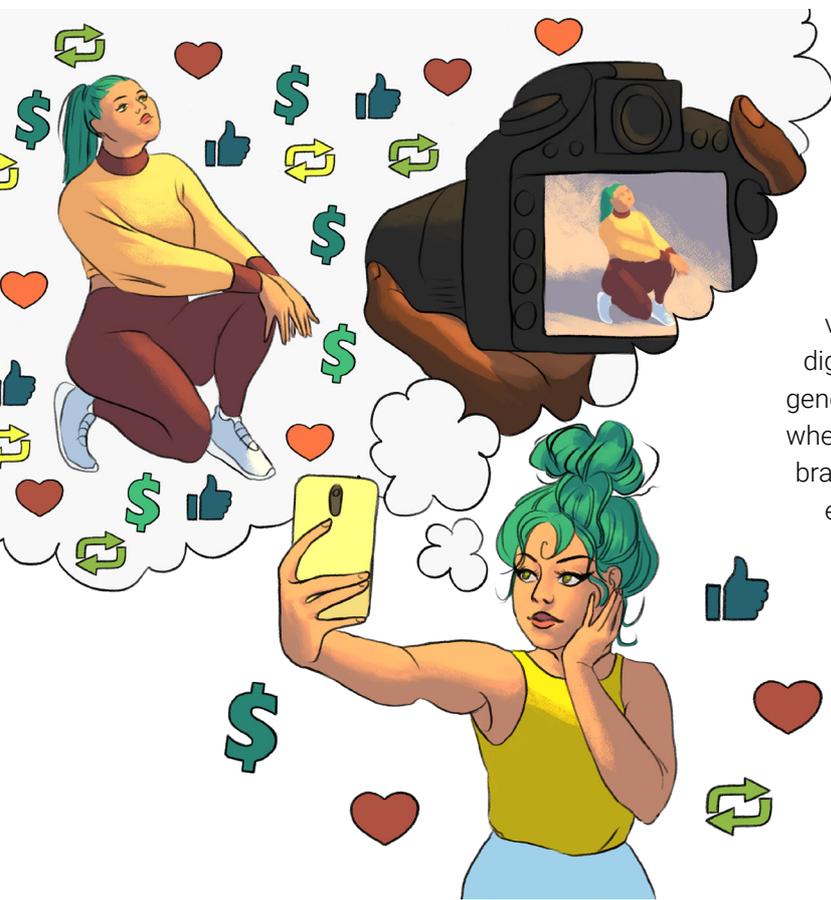
Any number of intrinsic and extrinsic motivations may drive youth participation in the digital economy. Intrinsic motivations include passion, enjoyment, creativity, self-expression, meaning, progress, and skill development. For example, youth who produce gaming videos on YouTube may feel a sense of pride in developing a certain style or in sharing high-quality content. They might continually try to improve the quality of their videos and think of new ways to express themselves. Among the extrinsic motivations, financial and social rewards feature as key inspirations. Some youth are chasing fame or seeking approval from their peers, while others hope to form connections online. As shown in Essay 1, young vegans, for example, have formed online communities through Instagram. Within these communities, users can share recipes and lifestyle tips, connect with others who have similar values and interests, earn a reputation by amassing “followers,” and even earn money through advertising products in their posts, if they have a high volume of followers.



Developing an Economic Mindset

As youth become increasingly aware of their ability to earn social, cultural, and economic capital through their online activity, they may cultivate an economic mindset. Such a way of thinking could be motivated by various rewards (intrinsic and extrinsic) – some monetary (e.g., advertising or sponsorship revenue), others more abstract (e.g., cultural and social gains through high followership); some short-term, others long-term according to young people’s needs, aspirations, and cultural and socioeconomic contexts. Future research could investigate the contributing factors that are relevant to the development of the economic mindset, whether they be age, race, gender, education, time spent online, peer influence, parental influence, or others.





Short-Term and Long-Term Gains

While it is likely that young people are initially focused on the short-term gains of social media activity, such as having fun online and connecting with peers, there is the potential that, as their social media use becomes increasingly sophisticated, they realize that they can try to work toward more long-term gains. Depending on contextual factors and the environment in which they grow up (e.g., their family, school, community), a young person might see the development of their online skills in the present as an investment in their future. Some youth undertake online activities for little to no compensation because they hold the opportunity of future social or economic capital. One example is Instagram “influencers” who invest time, effort, and money to accrue followers, earn reputation, and transition into paid activities (as described in Essay 1). This phenomenon has been called “aspirational labor” and is explored in Essay 2. It is important to note that the ability to participate in aspirational labor is restricted to those who can afford the significant outlay of money and time without reaping an immediate financial benefit.

Metrics of Youth Value Creation

The activities youth develop as they grow up as consumers, producers, and users generate value for platforms and services. Although this value is, in many cases, economic, such as when digital platforms profit from the data that users generate, it can also be social and cultural, such as when youth are able to build audiences and personal brands. However, independent of the kind of economic value youth generate when they engage with digital content and platforms, there are not yet clear metrics to assess and measure alternate forms of value creation. This lack of metrics has contributed to making invisible the creative and affective labor that youth are doing on digital platforms — the work of millions who have not become influencers or celebrities.

Collaboration and other Socioemotional Skills

Over the last two decades, there has been an increasing focus on identifying the skills youth need to develop for success in a digital world. Such skills may be technical, including sophistication in navigating the Internet or the ability to code. However, some researchers are honing in on the importance of non-technical socioemotional skills, such as collaboration, creativity, innovation, and empathy. Essay 3 provides a case study that demonstrates the importance of socioemotional skills in networked environments, focusing on how youth work together in projects online by deploying different levers for collaboration.

Young People’s Position in the Digital Economy

Using a socioeconomic macro-structural perspective — that is, by looking at the ownership of the means of production and communication, as well as the accumulation of financial capital — researchers have criticized the political economy of the networked media environment by revealing the imbalanced power relationships between corporate platforms and users. For further reading, see Essay 1. Young people are participants in a digital economy in which they produce personal, transactional, and user-generated data that is traded and mined by corporate platforms with for-profit business models. When youth, like





other users, watch videos on YouTube, share links on Facebook, post entries on Tumblr, publish photographs on Instagram, or play massive multiplayer online games, they generate data about their browsing and communication behaviors that is sold to advertisers and analyzed for marketing purposes, posing potential risks to privacy and surveillance. Hence critical perspectives have argued that corporations may take advantage — by trading, monetizing, and/or converting data into financial capital — of the labor of young people without compensating them for their product in an equitable way.

Digital Labor, Digital Play

By problematizing the pleasurable, creative, and voluntary nature of most of the activities that users do online, some scholars have also discussed the blurring lines between work and leisure, and work and play. These spheres of life, which have previously been conceptualized as independent realms, are undergoing a process of redefinition as online activities mix elements of play, fun, and leisure with work and value creation, particularly in creative industry settings. Scholars have even used the term “playbor,” a composite of play and labor, to describe the work that fans and gamers do on corporate platforms. In an additional effort to emphasize the fact that the majority of users do not receive monetary compensation for the various activities they do online, new terms such as “free labor,” “immaterial labor,” and “affective labor” have been used to describe the new irregular forms of labor that have emerged.

Youth and Adults: Competition and Collaboration

Generally, adults own, design, govern, and moderate the online platforms and services that are used by youth. This creates a power asymmetry in which youth tend to be in a position of disadvantage, particularly in regards to resources. For example, when competing for followers, sponsors, or viewers, adult producers, particularly corporate producers, have access to vast resources, such as teams of developers, designers, marketers, and capital (OECD, 2016). However, the digital economy provides an opportunity to flip the old power dynamic on its head. While youth producers of content may have limited resources when compared to corporate or adult producers, they still have other resources of value — like time, creativity, skills, and in-depth knowledge of the culture of their target audience (other young people). In combination with the direct access to the market that is afforded by the digital economy, it is no wonder that young people are now considered to be serious economic actors.

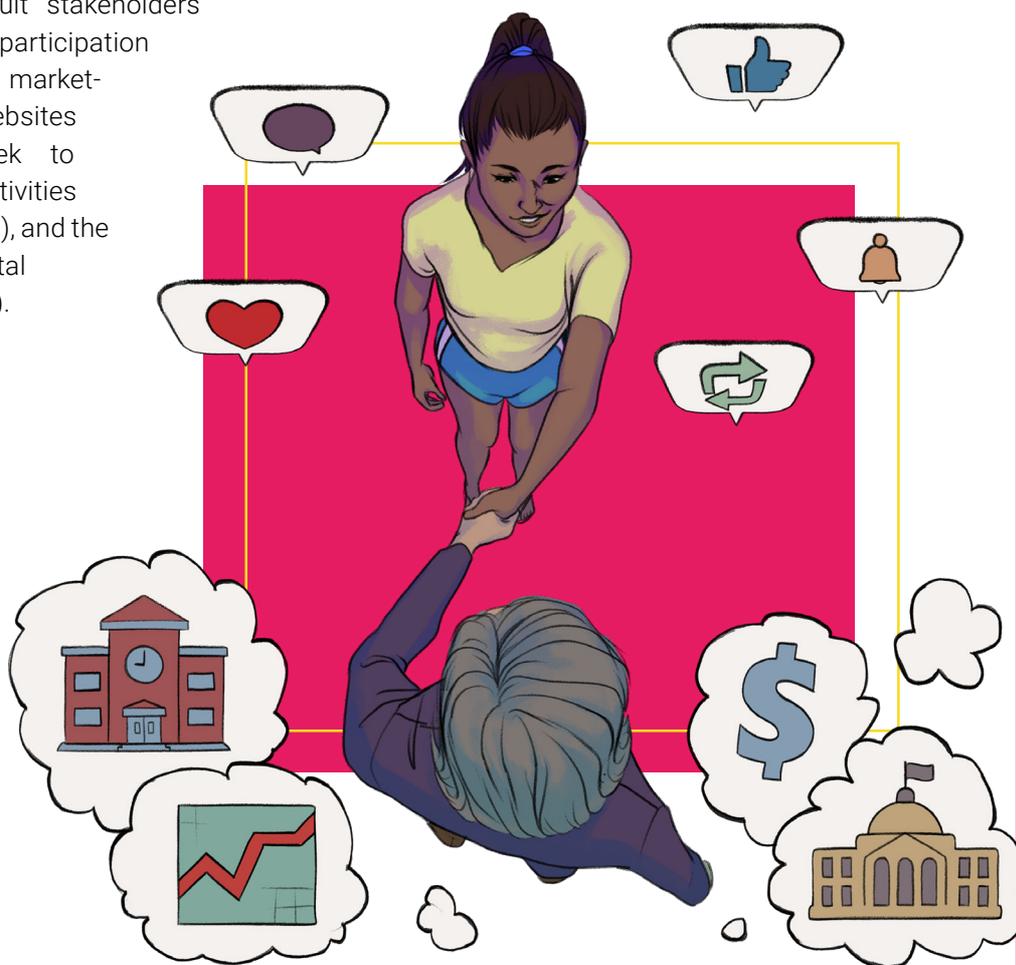
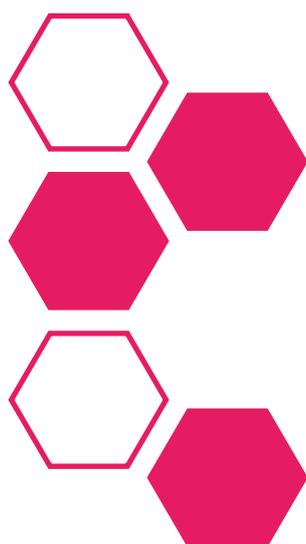


Supporting Youth Enterprise

Many adult stakeholders across the governmental, vendor, non-profit, and other sectors are increasingly engaging with youth's online entrepreneurial and consumer identities, self-brands, and lifestyles. Notable emerging engagement activities by governments provide youth with learning experiences (both in and out of traditional school settings) that relate to digital economic life, particularly through the framework of "digital citizenship."³ For example, the governments of Australia and Chile, as well as the state of Washington in the U.S., have developed educational initiatives around "digital citizenship" that try to foster the ability to produce and circulate content with digital tools and networks (Enlaces, 2017; Media Literacy Now, 2020; Wittman, 2019). Similar educational efforts are emerging in the non-profit space. For example, the LRNG platform creates learning pathways toward economic opportunity for youth. Other adult stakeholders are seeking to foster direct youth participation in the digital economy through market-based interactions. Commercial websites are engaging youth who seek to communicate their day-to-day activities through digital content (Hess, 2017), and the fashion sector is cultivating digital youth participation (Parmley, 2017).

Parental Guidance Advised

Market-oriented stakeholders are not limited to companies. Some parents are active "sharents," using their children's experiences to create and monetize content based on the parents' or families' lives. There have been moments when these practices have veered into terrain that many have found troubling, such as the parents who drove their children to tears and then recorded the results (Ohlheiser, 2017). But there are also many moments that gain notoriety for the spontaneity and joy that youth antics bring to viewers, such as the BBC interview that was derailed by a toddler (Hauser & Victor, 2017). As the lines between the previously more private spaces of childhood, home, and school blur into the public sphere, the methods and motivating factors for translating youth experiences into economic value are rapidly evolving.

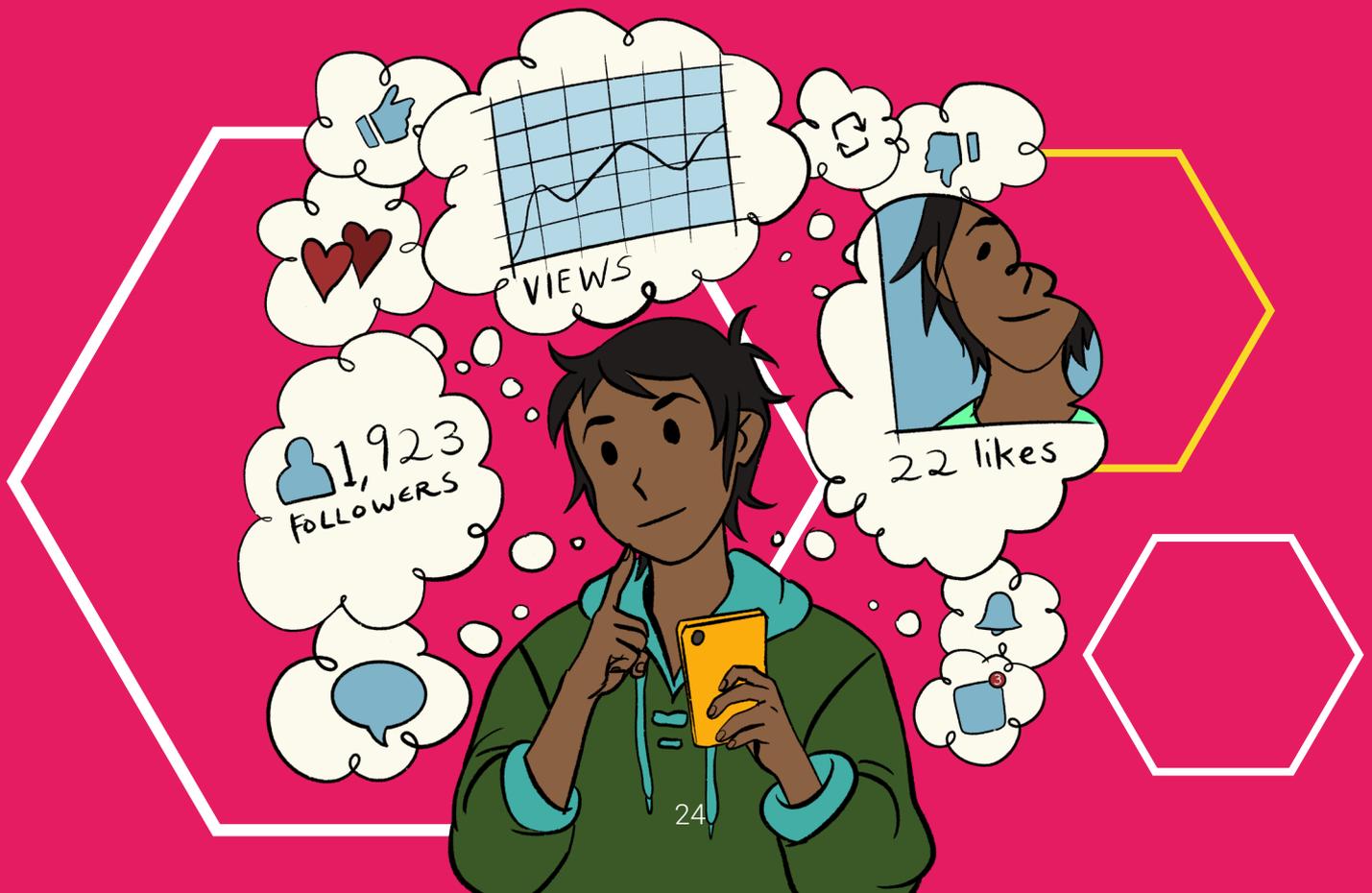


³ To learn more about frameworks around digital citizenship, and similar concepts, and the skills youth need to meaningfully engage online, please see Youth and Media's *Youth and Digital Citizenship+ (Plus): Understanding Skills for a Digital World* (Cortesi, Hasse, Lombana-Bermudez, Kim, & Gasser, 2020).

II. ESSAY 1 – YOUTH AND CAPITAL-ENHANCING ACTIVITIES

Abstract: Some youth are actively participating in the digital economy by engaging in online activities that help cultivate social, cultural, and economic capital. These activities involve the creation and sharing of multimedia content on a range of social media platforms, as well as making social connections and communicating with others. This type of participation can be understood as a form of cultural and technological labor that generates value and allows youth to earn different forms of capital and improve their status. However, as digital divide

scholars have argued, not all youth participate in these kinds of activities. Differential engagement in activities that enable youth to develop social, cultural, and economic capital creates a knowledge gap in terms of the skills needed to participate in the digital economy, and exacerbates offline inequalities. In this essay, we seek to answer the following questions: What are the online activities that allow youth to enhance capital? What forms of capital do they earn through online activities? On which platforms do these activities take place?



1. INTRODUCTION

Unsure of what she wants to cook for dinner, Miray⁴ — a young vegan — scrolls through her Instagram feed looking at photographs of delicious restaurant meals, creative homemade dishes, and social gatherings within the vegan community. Although Miray has more than 50,000 followers, she only follows 500 of her favorite vegan feeds. The leafy green and fruit-filled square photos inspire her to create her own grilled peach and kale salad recipe. After making the dish, she posts a photo of the meal to her Instagram account and shares the new recipe with her followers. Sometimes, she makes recipes with products from companies that have sponsored her own posts. Other times, she shares a discount code to an online website — if her followers use the code to buy vegan goods, she will earn a commission. She hopes to publish and promote a new vegan cookbook in the upcoming year.

Though most youth will not have millions of followers on their accounts, social media is brimming with young users who are consuming, producing, and sharing content online. In this way, youth are not only contributing to a dynamic culture, but also participating in a changing economic landscape. The

networked communication environment has rapidly evolved in the past decade, consolidating itself as an ecosystem of commercial and non-commercial platforms that offer youth opportunities to learn, socialize, play, and earn different forms of capital. However, such an ecosystem also presents risks for youth, such as invasion of privacy, exploitation of free labor, and surveillance.

In this essay, we present a sociological framework for describing youth practices online and their participation in the digital economy. This framework allows us to describe the capital-enhancing activities of youth online and understand the tangible outcomes that may result. The outcomes are not only in the form of earning economic capital, but also in cultivating social and cultural capital. Developing these different forms of capital may improve prospects for success and social mobility. Drawing upon this sociological framework, this essay seeks to answer the following questions: What are the online activities that allow youth to enhance capital? What forms of capital do they earn through online activities? On which platforms do these activities take place?

2. CAPITAL-ENHANCING ACTIVITIES

In focusing our analysis on the micro-level of individual agency, this section examines the ways in which youth are developing different forms of capital online. Playing online computer games can help youth cultivate a strategic and collaborative mindset and an understanding of a specific subculture (Jenkins et al., 2009; Junco, 2014). Sharing self-produced music videos can garner attention and promote youth's talent. Liking or commenting on a friend's Facebook or Instagram posts can help maintain existing relationships. In this way, online activity can be understood as a form of agency, as it enables youth to participate in an economy that is not only associated with earning money, but also can result in the development of social and cultural capital.

In this essay, we focus on the activities that we believe generate more capital and have tangible outcomes; these activities will hereafter be referred to as capital-enhancing activities (CEAs). A guiding question for considering CEAs is: What are the benefits of these activities for the individual? CEAs have visible outcomes and reveal a concrete purpose for improving status and gaining some form of capital. Other activities may generate less or no capital, and not have tangible and visible outcomes. For example, engaging in single-player Facebook games would generate less social capital than interacting with other users on YouTube or Twitch by livestreaming, responding to audience comments, and creating a fun, interactive environment.

⁴ Miray is a fictional character based on real-world examples.

Previous research explored how “engaging in capital-enhancing activities is more likely to offer users opportunities for upward mobility than certain other types of online activities” (Hargittai & Hinnant, 2008, p. 607). Researching the multiple dimensions of inequality online, DiMaggio et al. (2004) identified variations in the uses of technology, highlighting the fact that while some activities increase economic welfare or social and cultural capital, others are merely recreational and do not contribute to improving one’s socioeconomic prospects.

Hargittai (2010), who was part of the research team led by DiMaggio at Princeton, explained in another study that CEAs “are types of online actions from which people may benefit, whereas [recreational activities] likely have fewer pay-offs related to one’s social status” (p. 95). Hence, CEAs are digital practices that have tangible outcomes. That is, benefits in terms of some sort of capital gain. In contrast to casual and recreational uses of technology, CEAs are more similar to traditional “work” in that they require more time and energy, as well as a particular disposition and confidence. These activities also allow youth to exercise their agency and express individuality and independence.

While the digital economy offers opportunities for youth empowerment as creators and more savvy consumers, this networked ecosystem also presents the risk of exacerbating existing social inequalities. Research on a so-called “third-level digital divide” has shown that individuals with higher social status benefit more from online engagement than those with lower socioeconomic status (van Deursen & Helsper, 2015). This divide goes beyond access to technology

(first-level) and skill development (second-level) to focus on outcomes of technology use – “gaps in individuals’ capacity to translate their Internet access and use into favorable offline outcomes” (van Deursen & Helsper, 2015, p. 30). These differential outcomes across socioeconomic lines emerge as a challenge for equity.

Some of the researchers looking at the participation gap have noticed these varying outcomes around Internet usage, particularly in terms of the production and publishing of content online, across different populations (Hargittai, 2009, 2010; Hargittai & Walejko, 2008; Robinson, 2009; Schradie, 2011; Seiter, 2008). Since not all youth are engaging in capital-enhancing activities – or not to the same extent – there is a differential ability to enhance social, cultural, and economic capital online (van Deursen & van Dijk, 2013; van Dijk, 2005).

When considering varying outcomes of Internet use, some digital divide scholars emphasize opportunities, such as seeking financial information, obtaining jobs, and learning about public issues (van Deursen & Helsper, 2015). However, we conceive of CEAs in a broader sense. Drawing from Pearce and Rice (2017), we understand CEAs in three groups: relational maintenance, access to new relationships and information, and reputation building. More concretely, youth engaging in CEAs are cultivating old and new friendships online; creating, consuming, and sharing content, such as photos, videos, and news stories; and cultivating their online presence in online communities and networks. These activities allow youth to connect to communities, networks, information, jobs, and politics.

3. DEVELOPING FORMS OF CAPITAL

The Sociological Approach

In this essay, we combine sociological frameworks to study different forms of capital. Drawing on Nan Lin’s “neo-capital theories,” we diverge from the traditional macro-level Marxian theory and focus instead on the micro-level explanation of individual actors (Lin, 2001, p. 17). Lin focuses on the actions and choices of individuals. New capital theories go beyond

economic capital to consider other forms of capital, such as social and cultural.

In neo-capital theory, Pierre Bourdieu, James Coleman, Nan Lin, and Robert Putnam emerge as prominent theorists. However, for the purpose of this essay, we will not present their nuanced theories. Instead, we present the three forms of capital – social, cultural, and economic – more generally, as a

lens with which to describe outcomes of youth activity online and better understand how social inequality is reproduced. There are many ways to develop these different types of capital, but it is crucial to consider all three forms in determining “the chances of success for practices” (Bourdieu, 1986, p. 15). As we map these different types of capital onto youth activity, we can better understand which online activities develop which forms of capital and how capital is distributed among different youth populations.

Social Capital

When navigating the digital space, social capital emerges as a key consideration, both in terms of maintaining existing ties and expanding one’s networks. Putnam (2000) defines social capital as “connections among individuals – social networks and the norms of reciprocity and trustworthiness that arise from them” (p. 16). For Putnam, there are two main forms of social capital: bridging and bonding. In the previous, social capital consists of connections across different populations. The latter, on the other hand, consists of connections among people with common interests (2000, p. 23). Through these networks, users may access information and influence, receive recognition, and develop social credentials.⁵

Within the community of young vegan Instagrammers, it is possible to identify ways in which activities on the Instagram platform enable development of social capital. Instagram allows users to share photos of their meals and recipes, as well as interact with others through comments, likes, and hashtags, thereby forming lifestyle communities online. It appears that the vegan Instagram community largely consists of young girls and women who are often white and from wealthier backgrounds. Those who maintain vegan diets likely have greater discretionary income and offline connections to these sorts of networks.

Within these communities, users often engage in CEAs. By maintaining and creating new connections through sharing and consuming content, exchanging

information about vegan living, and following other accounts, community members can expand their social networks and access a greater volume and diversity of resources. Immersion in an online vegan community can expose youth to the latest cooking trends, different vegan product contests, or reflections on the political aspects of veganism. These online communities sometimes create offline meetups. For example, sometimes they form local vegan community groups that host potlucks, panels, and information sessions. The main goal of these offline exchanges seems to be forming social connections or friendships for support and information-sharing, both of which benefit community members.

Bourdieu describes the “volume” of social capital held by one person as dependent on “the size of the network of connections he can effectively mobilize and on the volume of the capital (economic, cultural or symbolic) possessed in his own right by each of those to whom he is connected” (1986, p. 21). This “network of relationships” results from investing in social relationships that offer future benefit (Bourdieu, 1986, p. 22). Connections can serve as resources for Instagram users, but outcomes depend on how strong these relationships are or how effective users are at mobilizing them. Vegan Instagram users often befriend other vegans with popular Instagram accounts. If their relationship is strong, two vegan-oriented accounts may choose to promote one another in their respective feeds, thereby expanding each account’s reach.

One way young vegans mobilize their social capital is through effective management of followers, which, in turn, allows them to monetize their posts. The more followers an Instagram user has, the more attractive their account is to companies seeking advertising channels. Tina, a 15-year-old young vegan managing the @superkale2001 Instagram account, for example, curated a vegan feed that kept followers interested with photos of her latest food creations and aesthetically pleasing restaurant plates.⁶ By tagging the restaurant location or the company of

⁵ Putnam’s notion of bridging and bonding builds up on Mark Granoveter’s conceptualization of weak and strong ties. Granoveter (1973), a pioneer in social network theory, used the strength of ties to describe the different kinds of connections people develop and maintain with each other. Weak ties are the ones developed among acquaintances or strangers from different populations and groups (as in Putnam’s bridging). In contrast, strong ties are the connections people keep with their friends, family, and colleagues and are characterized by deep affinity (as in Putnam’s bonding).

⁶ Vegan names and Instagram handles are pseudonyms.

a product she used – e.g., “vegan banana bread studded with @coco_health coconut milk chocolate chunk” – Tina could profit from her social capital (50,700 followers as a count) through advertising posts. Young Instagram users, then, become brand managers and have to constantly post high-quality content to stay “relevant” – that is, to be interesting to their followers.

Another community in which social capital features largely is that of gamers on YouTube and Twitch. Fan bases of certain youth who publish video game reviews or stream their video game play often become loyal members of that group – to the extent that they threaten users who post negative comments. Subscribers sometimes identify as loyal fans and will follow all the account’s activity, increasing the view count, and consequently, the potential to earn money. @AaronGamer00, for instance, is a 12-year-old gamer who livestreams his play on Roblox, Minecraft, and mobile games on YouTube. He has 1.6 million subscribers and 900 million views on his account. The comments on his videos are usually praise, criticism, requests for recognition, and invitations to collaborate in projects. Since Aaron is a minor, his parents supervise his online communication and manage his YouTube channels, and other social media accounts (e.g., Instagram and Twitter). His parents also provide access to computers and media gear at home and support AaronGamer video production and streaming. @AaronGamer00 fans are representative of the social capital Aaron has gained. Leveraging that social capital, Aaron was able to build another popular YouTube channel (@Aaron), where he develops other genres of video such as unboxing and everyday vlogging.

While some youth watch gaming channels to improve their own gameplay, others watch them for entertainment. Differential social capital also raises the issue of access to information and knowledge. When youth have more social capital, they can have access to more opportunities. CEAs help youth obtain more helpful information and resources, which, in turn, allows them to save time and generate new opportunities (DiMaggio et al., 2004; Dobransky & Hargittai, 2006; Pearce & Rice, 2017; van Deursen & Helsper, 2015).

Cultural Capital

When considering CEAs, we must also explore cultural capital, which refers to the cultural knowledge of an individual that enables him or her to hold a certain social status. According to Bourdieu, cultural capital can exist in “objectified,” “embodied,” or “institutionalized” forms (Bourdieu, 1986).

Objectified cultural capital refers to physical objects that have significant cultural meaning (i.e., having luxury goods or the latest iPhone signifies one’s financial resources). It also means that one has the resources to engage with a certain subset of society. For example, those who own the technology necessary for posting high-quality photos on Instagram can better convey their cultural capital. The popular category of lifestyle bloggers and Instagrammers, for instance, has a high barrier of entry. The content of these accounts often consists of users dressed to the nines in luxury clothes, traveling to far-off places, and ordering from five-star menus.

Embodied cultural capital, on the other hand, refers to cultural capital that is developed over time, often as a result of one’s upbringing, and manifests in one’s language, tastes, and cultural knowledge. It is related to the “long lasting dispositions of the mind and body” (Bourdieu, 1986, p. 47). Consuming content is an important part of developing embodied cultural capital. For instance, young gamers often watch other gamers’ videos as part of knowing the ins and outs of a specific subculture (e.g., Steam, Twitch, and YouTube gamers) and developing certain kinds of dispositions, such as the particular jargon of a game and its players.

Finally, institutionalized cultural capital consists of the formal credentials given by an institution, such as a school or a university. Educational qualifications and titles, for instance, provide “entirely original properties on the cultural capital which it is presumed to guarantee” (Bourdieu, 1986, p. 47). However, other institutions, such as learning organizations and online learning platforms, may also provide forms of recognition that can be considered institutionalized cultural capital. Digital badges and certificates of completion of online courses, for instance, are examples of these forms of credentials.

Cultural capital, particularly the embodied and objectified forms, can be seen in the way youth build reputation and create personal “brands.” From building a small audience of followers to gaining more visibility online — even becoming a social media influencer or a celebrity — cultural capital figures prominently in the “success” of youth online. For the purposes of this essay, success is defined by the ability to improve one’s status. Likes, retweets, comments, and shares have all become cultural goods in the sense that they help increase one’s standing. For example, the number of YouTube video likes and views speaks to the cultural capital of the video producer. @AaronGamer00’s videos have high production value, which not only appeals to viewers, but also reinforces his position as a YouTube gamer of high status.

As Bourdieu (1986) explains, the accumulation of cultural capital in the embodied state, in what he refers to as “cultivation,” requires personal investment of time to improve the quality of the content one produces (p. 18). This cultural competence is important for building one’s reputation online as there are soft cues and unwritten guidelines for what one should produce in terms of content, how one should share content, or the ways in which one should engage with other users.

Economic Capital and Conversions

Economic capital is the most well-known form of capital. Youth have found many ways to monetize their activities, including corporate partnerships and advertising revenue. As Bourdieu (1986) notes, the different forms of capital are all related. He posits that all capital is derived from economic capital, even if it can never be reduced to that form, which renders the other forms of capital useful in their own ways (p. 24). These transformations of social or cultural capital into economic capital, and vice versa, are called “conversions” (Bourdieu, 1986, p. 25). Within the realm of youth activity, it is evident that social and cultural capital can be monetized, and that money often aids development of social and cultural capital.

With the previously mentioned example of young vegans, what starts off as a lifestyle choice and “play” in the kitchen can often develop into a revenue source and an entry point into learning social media strategies. Earnings may come from influencer marketing, which involves the advertising of products and restaurants to followers through posts. The economic mindset to gain more followers can often be seen in engagement with followers through contests and giveaways (e.g., promoting a contest to win a jar of almond butter by tagging friends in a photo).

Economic conversions can also be seen when youth review books on various social media platforms. Examples include Calen Armstrong, who has a large following on YouTube and Instagram, and Wing-ye, who blogs and uses Instagram. Oftentimes, these book reviewers will share their content across multiple platforms, with blogging sites and Instagram being the two most popular. In the process of reviewing books, these youth are developing reading and writing skills, as well as an economic mindset and entrepreneurial attitude. They must convince publishers that they are qualified or have an adequate reach in terms of followers in order to receive free books.

The social and cultural capital developed on these platforms can translate into earnings from advertising revenue, partnerships, or future jobs. YouTube, for example, offers users membership to their YouTube Partner Program — an opportunity for monetizing content through advertising revenue — once they have reached 10,000 public views. The lure of creating a successful brand and monetizing it has even resulted in entire stand-alone programs devoted to online branding and revenue-generating activities, such as SocialStar Creator Camp — a summer camp that helps youth learn the ropes of Internet stardom, brand management, and monetization. Twitch, another online video-streaming platform, offers a program called the Twitch Partnership Program (TPP) that gives streamers access to resources that will help them maximize their revenue, such as

monetizing channel subscriptions and broadcasts. In order to be part of the TPP, one must be 13 years or older and go through a formal process before being recognized as a partner. Many young video streamers use Twitch not just as a hobby, but also with aspirations to become a Twitch partner and in

the hopes of pursuing a potentially lucrative career, much like that of Tyler “Ninja” Blevins who reportedly earns 500,000 U.S. dollars a month from Twitch (Kim, 2018). Some have succeeded on a smaller scale, including 14-year-old Jaxstyle and Minim0E_tv.

4. CONCLUSION

With a focus on youth, it becomes clear that there are both opportunities and risks as the prevailing narrative shifts from youth as a vulnerable consumer population to youth as content consumers and producers. While critical political economy scholars such as Andrejevic (2009, 2013), Fuchs (2010, 2013), Terranova (2000, 2004, 2012) and Scholz (2008) present much of people’s online activity as exploitation and free labor – which is a legitimate concern – in this essay we investigated the ways in which this new ecosystem enables youth to develop social and cultural capital, as well as sometimes earn economic capital.

By shifting our analysis from the macro to the micro level – from traditional Marxist theories of capital to neo-capital theories – we can see how different forms of capital are at play within the digitally networked environment. More specifically, in this essay we describe the types of activities that develop each form of capital, expanding on the current understanding of CEAs. Beyond what digital divide and digital inequality researchers have considered, we see tangible outcomes in various forms of capital in a greater variety of youth activity online. Increasing followers and maintaining networks increases social capital, while participating in subcultures and online communities helps develop cultural capital.⁷ These forms of capital can often be converted into economic capital, which can further increase social and cultural capital as individuals will have access to better resources. This cycle, however, presents a risk for exacerbating existing inequalities.

In hypothesizing that there are differential outcomes of Internet usage across lines of socioeconomic difference, we believe it is important to understand why some youth are earning social, cultural, and economic capital, while others are not – or, at least, not to the same extent. Which activities allow youth to earn these forms of capital? What are the characteristics of youth who are able to earn capital? Are there disparities across lines of race, gender, and social class? How important is family background and parental support? We hope to explore these and other lines of inquiry in our upcoming round of focus groups with young people about their economic activities in the digital landscape.



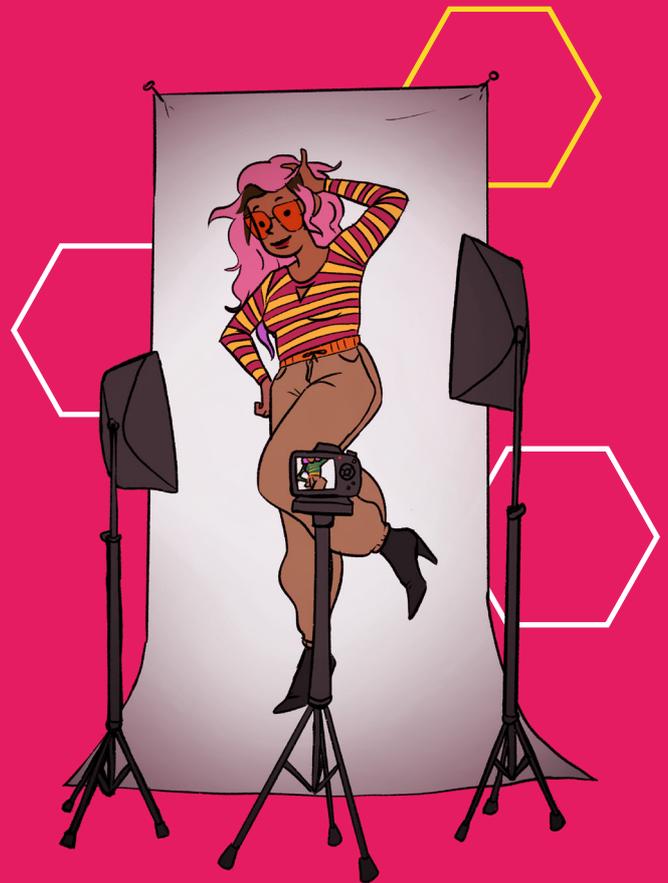
⁷ In the second essay of this collection, “Youth and Aspirational Labor,” we discuss how these activities can also be understood as forms of “hope” or “aspirational” labor. That is, labor that is performed as a way of gaining experience and exposure, as well as a practice that allows the development of skills.

III. ESSAY 2 – YOUTH AND ASPIRATIONAL LABOR

Abstract: Aspirational labor is a term used to describe young people undertaking labor for free in the hope of future payoff (Duffy, 2015, 2017). After a brief description of the structural factors in the economy that have encouraged this trend, we describe scholarly models connected to aspirational labor and those industries in which the practice is prevalent, particularly the creative industries. In the final section, we consider several factors in the context of this form of labor, such as the participation divide, the role of self-branding, and the dichotomy between aspirational labor as providing opportunities, as well as presenting risks.

1. INTRODUCTION

For the last four years, 20-year-old Nick has published the video game music he produced in his bedroom on SoundCloud, an online audio-distribution platform and music sharing website. Nick aspires to become a professional video game music producer. Nick is well connected in the local indie game community and contributes to projects by composing music. Although he is yet to receive any compensation for his work, Nick is hopeful that his connections will eventually lead to a paid job on commercial projects. In the meantime, he has rigorously pursued his passion by attending a music college, working in his own time to expand his digital portfolio, and learning from other online creators about production techniques, styles, and subgenres of music. Three years after joining SoundCloud, Nick had assembled a portfolio showcasing 10 video game soundtracks and three playlists, has almost 300 followers, and some of his tracks have been listened to thousands of times.



Stories such as Nick's demonstrate the phenomenon of "aspirational labor," a term used to describe young people undertaking labor for free in the hope of future payoff.

In recent years, the western economy has become progressively characterized by project-based, independent, and temporary work (Brophy, 2011; Bulut, 2015; Cohen, 2012; de Peuter, 2011; Gill, 2007; Horowitz & Rosati, 2014). Many young people, the Bourdieusian "precarious generation," are aware of this breakdown of traditional career structures and are particularly likely to find themselves un- or underemployed in low-paying and informal jobs with little expectation of traditional work security (Beck, 2000; Lehdonvirta & Ernkvist, 2011).

An awareness of neoliberal selfhood has increased the focus on entrepreneurialism as a desired work “mode,” as promoted by industry, governments, media, and individuals (Banet-Weiser, 2018; Florida, 2002; Neff, Wissinger, & Zukin, 2005; Ross, 2004; Ouellette, 2016). Young people are drawn to the promise of autonomy and employment flexibility with the freedom to control their own time (Arvidsson, 2008; Neff et al., 2005; Shirky, 2010). In Tanti’s (2015) article on the presentation of youth entrepreneurs within children’s media, Tanti notes that children’s programming on television reflects an idealization of creative labor to the extent of becoming focused on the challenges of balancing a childhood and career as youth fashion designers, celebrities, and newsmakers. Young people who aspire toward digital media work are indeed becoming “entrepreneurial,” organizing their work into “portfolio careers,” and perhaps becoming accustomed to the idea of precarious employment (Beck, 2000; Flew & Cunningham, 2010; Neff, 2012; Pink, 2001; Storey, Salaman, & Platman, 2005).

Young people seeking to join the digital media workforce face a lack of clarity as to methods and means of entry. Within digital media organizations, there is a widespread lack of standard career ladders, alongside a lack of formality and linear development, with many individuals creating a career along a

pattern of project work instead (Gill, 2010; Neff, et al., 2005; Townley & Beech, 2010). This dearth of formal structure is mirrored in ambiguity surrounding how to join these new digital careers. There is limited advice on how to become a fashion editor, video game programmer, or online journalist beyond the limited number of “success narratives,” namely the autobiographical advice of the few individuals who have “made it” (Brabham, 2008). The advice tends to focus on success as serendipitous or due to consistent platform exposure. A common thread in all these narratives is the “rhetoric of possibility,” which suggests — without any factual basis — that entry into these desirable careers is possible for everyone and success will be based on factors such as effort and passion (Chia, 2012; Duffy, 2016).

In reality, securing a position in desirable digital media industries is increasingly based on pre-demonstrated ability, social networks, and cultural and social capital, rather than formal credentials and job applications (Gill, 2002, 2008; Neff et al., 2005).⁸ Thus, there is a “career progression paradox” whereby aspiring entrants need industry connections and a track record of good work but have limited means of acquiring these assets (Corrigan, 2015). One of the few methods available for young people to gain industry connections and a track record of excellent work is to offer free labor online.

2. ASPIRATIONAL LABOR: AT THE HEART OF THE ISSUE

The model of providing free labor in the present for employment opportunities in the future has been the subject of scholarly discussion (Brabham, 2008, 2010; Hesmondhalgh, 2010; Kücklich, 2005; Murdock, 2011; Postigo, 2007; Ross, 2013; Tapscott & Williams, 2006) and has recently been conceptualized through a number of theoretical frameworks.

In 2012, building on her 2005 concept of “entrepreneurial labor” in which digital workers are encouraged to invest in entrepreneurial projects in their own time for greater economic security, Neff

developed the theoretical concept of “venture labor” (Neff, 2005, 2012). The “venture labor” model reflects how young people undertake individual risk and develop their skills in the present as an investment in their future (Livingstone & Sefton-Green, 2016).

Building upon philosophical studies of hope as a “historico-temporal process” (Bloch, 1986; Schumacher, 2003; Scioli & Biler, 2009), the “venture labor” framework was further advanced in the conceptualization of “hope labor” by Kuehn and Corrigan (2013). “Hope labor” theory is distinguished

⁸ In the first essay of this collection, “Youth and Capital-Enhancing Activities,” we discuss some of the online activities that allow youth to earn different forms of capital (social, cultural, and economic).

from “venture labor” by the recognition of uncertainty in the future outcome. In “hope labor,” strategic employment-centric activities are undertaken either for free or under-market wages to provide opportunities for employment in the future with the understanding that success is largely outside an individual’s control. Kuehn and Corrigan (2013) emphasize that in “hope labor,” individuals do not develop a “false consciousness” but nevertheless engage in a systematically asymmetric economy due to the hope of success.

“Hope labor” involves the undertaking of risk, laboring on an unpaid or underpaid basis without the guaranteed promise of future reward. On the one hand, young people are able to take “economic risks” when they receive support from their parents or guardians. Moreover, young people have limited scope to earn money and lack a developed conception of fair compensation. In many cases of “hope labor,” the small economic gain that they might make in their “hope labor” activities is a gratefully received source of income rather than under-compensation for their fair labor.

Further expanding the theoretical framework with a focus on gender, Duffy (2015, 2017) introduced “aspirational labor,” a term that describes how “[a]spirational laborers pursue productive activities that hold the promise of social economic capital; yet the reward system for these aspirants is highly uneven” (2015, p. 441). They “seek to mark themselves as creative producers who will one day be compensated for their talents – either directly or through employment in the culture industries” (Duffy, 2015, p. 446).

For young people, this future-oriented “aspirational labor” model reflects how they undertake individual risk and develop their skills in the present as an investment in their future (Duffy, 2015; Livingstone & Sefton-Green, 2016). These activities are mirrored in the notion of the “youth” developmental period as a time for growth, learning, and skill acquisition. At school, students acquire education that might help them in the future job market and take on extracurricular activities to further increase their friendship networks and skills. For young people who are expanding their skills and networks online

– learning through creative expression – their actions should be seen as an online extension of their education.

For example, blogging, particularly fashion blogging, is a prominent area of “aspirational labor” (Boston & Duffy, 2015; Chia, 2012; Deuze, 2007; Duffy, 2015, 2016; Duffy & Hund, 2015; Luvaas, 2013; Marwick, 2013, 2015; McQuarrie, Miller, & Phillips, 2013; Nathanson, 2014; Rocamora, 2012). Blogs are a popular medium for teenagers in the formation and enactment of their developing tastes and social identities (Chittenden, 2010; Nurmi, 2004). They are discursive spaces to write and publish their thoughts, enabling teenagers to trade cultural and social capital. The EU Kids Online 2010 survey found that one in 10 children wrote a blog (Livingstone, Haddon, Görzig, & Ólafsson, 2011a, 2011b).

Academic studies in this field have been illustrative of the nature of blogging among young people as an “aspirational labor” activity. For example, Chia (2012) used a discursive analysis of personal blogging handbooks and personal blogs; McQuarrie et al. (2013), utilizing the theory of cultural capital, documented 10 fashion bloggers who achieved sizable audiences; Duffy and Hund (2015) conducted a qualitative analysis of the textual and visual content of leading fashion bloggers alongside in-depth interviews; and Duffy (2016) conducted in-depth interviews with participants on fashion blogs. These studies showed that, while the ostensible purpose of blogs is personal enjoyment, a common thread was that many young bloggers aimed to leverage their online labor and develop networks to transition into paid employment in a related field, such as fashion, television, or news media. In a related industry called “vlogging,” YouTube celebrities profit from advertising revenue from their video blogs (Chen, 2013; Palfrey & Gasser, 2016). A handful of success stories about YouTube celebrities – such as the 6-year-old boy who made \$11 million in 2017 by reviewing toys on YouTube – obscures the very low prospects of achieving fame as a vlogger. A recent randomized sampling analysis of 19,025 YouTube channels indicated the top 3% of channels in 2016 received almost 90% of YouTube’s total views (Bärtl, 2018) – meaning that the vast majority of YouTube videos disappear into irrelevancy.

Closely related to blogging and vlogging, and, in many cases, overlapping in terms of participation, are “social media influencers,” predominantly on Instagram. Influencers are young people who invest time, effort, and money to become a “microcelebrity” so as to expand their network and transition into paid activities, whether direct employment or sponsored advertisements (Abidin, 2016; Kozinets, de Valck, Wojnicki, & Wilner, 2010; Senft, 2008). Most influencers are able to profit from paid advertorials (Kozinets et al., 2010).

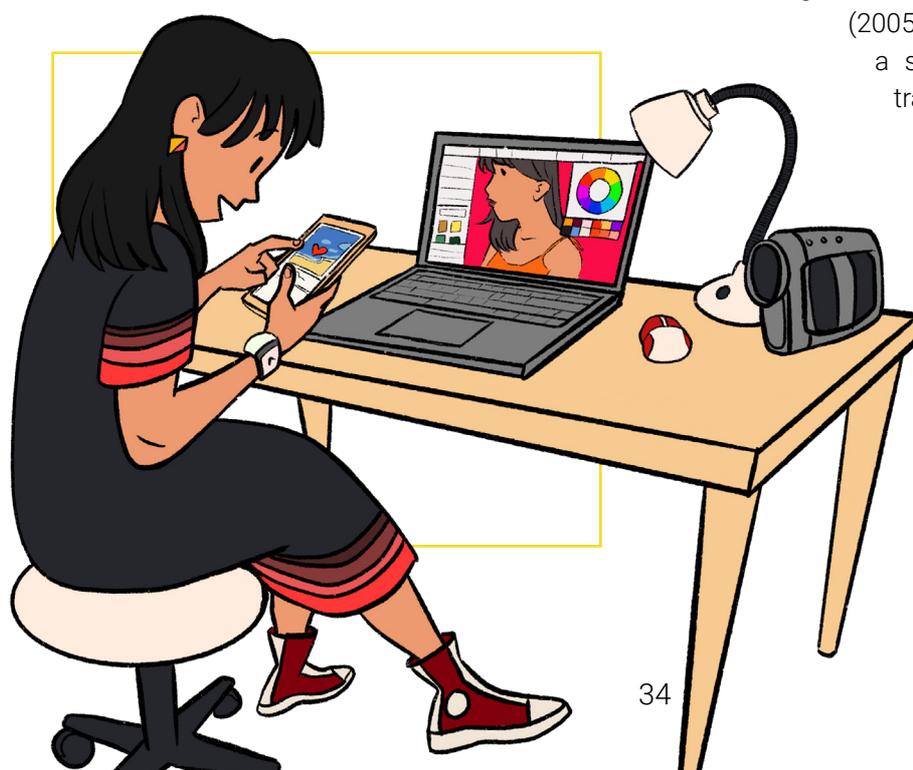
Related fields include the provision of free marketing, corporate public relations, and brand ambassadorship by individuals in order to gain exposure and integrate themselves into a company’s sphere of activity and consciousness (Boston & Duffy, 2015; Duffy, 2016). According to Schor (2004), tweens, namely those aged between 8 and 13, are “the most brand-conscious generation in history” (p. 25). Postigo (2003, 2009), examining the role of brand ambassador “community leaders” in online fora, found that among AOL volunteers, the desire to eventually be hired was a motivating factor. Kuehn (2016) examined consumer reviewing on Yelp, noting that reviewing was an instrument for self-branding and viewed as a tool to be utilized for current or future gain with many participants even graduating to become Yelp “ambassadors.” However, noting the exploitative nature of the relationship where companies are actively requesting free public

relations, Duffy states that, for the aspiring worker, “payment through visibility ensures that . . . labor remains invisible” (Duffy, 2016, p. 452).

We also see “aspirational labor” being carried out by young people within the artistic sphere. Fuller, Jawecki, and Mühlbacher (2007), investigating online consumer communities for basketball shoes, found that users were motivated to share their designs not only due to inherent enjoyment, but also “to become known as creative and innovative designers, get in touch with one of the major brands, [and] get an opportunity to start working for a well-known basketball company” (p. 69). Similarly, Brabham (2008, 2010) conducted a series of interviews with artistic contributors on the sites Threadless and iStockphoto to explore the motivations for participation, finding that the production and sharing of free artistic content was viewed as a way of gaining experience and exposure.

Given the close alignment between work and play in aspirational labor, another significant sphere of aspirational labor is online video games. Among teens, interest in video gaming is extensive, with the 2018 Pew Research Center Survey finding that 90% of American teens play video games of any kind (97% of boys and 83% of girls). One perceived route into the video game industry is in “fan-programming,” also known as “modding” (Hartley, 2006; Jenkins, 2006; Postigo, 2007, 2009; Taylor, 2006). Modding has become a dominant entry point for a career in the video game industry. Postigo (2007, 2009), Kücklich (2005), and later Bulut (2015) all noted a strong desire to exhibit skills and transition into paid work opportunities in the video game industry.

Participation in “modding” has been actively promoted by the video game industry since the 1990s with the inclusion of “authoring tools” in game packages (De Peuter & Dyer-Witherford, 2005). De Peuter and Dyer-Witherford (2005, p. 11) elaborate:



[When] young 'hardcore' gamers spend their evenings modding a level of a computer game, or sculpting an avatar for a virtual world – or, for that matter, contributing to their favorite developer's online 'community' forum – the boundaries between 'play' and 'content provision' subtly dissolve.

Yee (2006) has argued that players of virtual games can invest so much time in their virtual careers that playing becomes a form of obligation. Castronova (2005) similarly discussed how the trade of in-game artifacts from video games has become a job for many gamers who can earn money through selling virtual items. "Modding" is merged even further into work. Nieborg and van der Graaf (2008), exploring the relationship between non-market game developers (modders) and the developer company, found that many mod-projects are driven by industrial logic and

organized according to industrial-like practices: "In the case of the development of total conversion mods such as Counter-Strike, the development teams are seldom 'just guys'" (p. 189).

A second "aspirational labor" route into the video game industry is on the other side of the screen, with the phenomenon of Twitch.tv livestreaming. Increasingly, viewers are tuning in to online platforms, like Twitch.tv, to livestream their video gaming to an audience, organizing competitions, and tournaments (e-sports) (Hamilton, Garretson, & Kerne, 2014; Kaytoue, Silva, Cerf, Meira, & Raïssi, 2012; Pires & Simon, 2015; Taylor, 2018). Some of the top streamers on Twitch.tv have close to 2.5 million followers, and the site is one of the highest trafficked on the Internet. Similar to the more traditional "social media influencer," this form of Internet celebrity has sponsors and social media followers (Kaytoue et al., 2012).



3. THE FIRST STEPS TO SUCCESS: UPSIDES OF ASPIRATIONAL LABOR

When considering the benefits of aspirational labor for young people, one element that should not be overlooked is how these activities provide genuine enjoyment. These activities are unlikely to have commenced in the first place, unless they were an enjoyable hobby or creative outlet (Chittenden, 2010). Leadbeater and Miller (2004) noted that pro-ams (professional-amateurs) get intense, pleasurable, and satisfying experiences from their activities. Lakhani, Jeppesen, Lohse, and Panetta (2007), studying the crowdsourcing company InnoCentive, likewise found that intrinsic motivators, such as the enjoyment of problem solving, were significant for motivating those engaging in what we would term "aspirational labour." Brabham (2010), through a series of interviews, noted how community members who engaged in crowdsourcing work self-identified as "addicted" to the activity. Therefore, work should not be considered inherently objectionable or alienating just because it is free (Hesmondhalgh,

2010). As Kuehn and Corrigan (2013) stress, "Hope labour functions because it is largely not experienced as exploitation or alienation" (p. 12).

Another benefit of aspirational labor is the development of skills, which can be utilized later in seeking employment (Brabham, 2008; Hesmondhalgh, 2010; Livingstone & Helsper, 2010). Lakhani et al. (2007) identified skill acquisition as a key motivation for "crowdwork" participants. Postigo (2007), looking at "modders," saw that fan creation was a way of exhibiting and increasing skills so as to add content to resumes. Brabham (2008, 2010) similarly found that, alongside earning money, the opportunity to develop skills during free crowdwork labor outranked other motivations.

Bringing in social capital theory, scholarship has highlighted the networking element of aspirational labor.⁹ As previously discussed, due to the networked nature of the job market, it is crucial for young people

⁹ In the first essay of this collection, we review some of the neo-capital theories that sociologists have put forth to understand and analyze different types of capital, including social and cultural capital.

to develop what Deuze (2007) calls a “networked reputation,” alongside Mauss’ “profitable alliances” (Gill, 2010; Wittel, 2001). Online, young people are able to gain exposure and networks (Coté & Pybus, 2007). Chittenden (2010) and Chia (2012) both explored this concept, noting how, for bloggers, reader comments were considered paramount and could even be viewed as a form of payment, alongside advertising dollars. Similarly, Postigo (2007) noted that feedback in “modding” communities was an important motivation, and Kuehn (2016), discussing Yelp reviewers, noted the incentivizing and validating effect of social feedback. Arvidsson (2008), theorizing on “socially recognized self-realization,” notes the importance of peer recognition for young people who provide free labor online. This kind of exposure helps young people to build their own “brands” online.

Since its inception in the late 1990s, the movement of self-branding to improve employment opportunities has developed rapidly across the professional sphere. Increasingly, in today’s socially networked economy, people are looking toward future work opportunities to strategically brand themselves as a “product” both online and offline (Abidin, 2014, 2016; Arvidsson, Gandini, & Bandinelli, 2016; Arvidsson & Peitersen, 2013; Banet-Weiser, 2012; Chia, 2012; Gershon, 2014; Hearn, 2008, 2010; Lair, Sullivan, & Cheney, 2005; Marwick, 2013, 2015; Pooley, 2010; Wissinger, 2015). Gandini (2016), examining the position of self-branding among freelancers, argues that performing unpaid labor is a strategic device to construct social capital online due to the need to have a social reputation to secure work in the future. Theoretical concepts have also evolved around this element. Abidin (2014) has proposed the term “visibility labor” to describe the work of individuals in self-curating their online presentations so as to be noticeable for prospective employers. Wissinger (2015) further coined the term “glamour labor” to indicate the work undertaken to manage appearance both online and offline.

Since “aspirational labor” is undertaken in part to achieve exposure, self-branding is of vital importance (Coté & Pybus, 2007; Gandini, 2016; Gill, 2008; Hearn, 2008). It requires that young people performatively articulate their personal values and market themselves

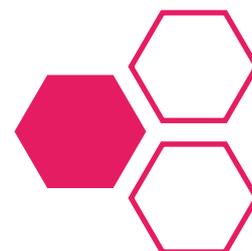
to construct a digital self (boyd, 2006; Hodkinson, 2015; Hodkinson & Lincoln, 2008; Livingstone, 2005; Papacharissi, 2002; Schau & Gilly, 2003; Sundén, 2003). Context, audience, and environment are all key factors driving self-presentation. Young people learn to be attentive to audience perception and conform to the “imagined audience’s” values (boyd, 2006; Ellison, Heino, & Gibbs, 2006; Litt & Hargittai, 2016). Teens present themselves online before the “imagined audience” of companies they would like to work for, in addition to their family, friends, and usual social network (Baron, 2008; Brake, 2012; Litt, 2012; Marwick & boyd, 2011). Young people adapt by switching social contexts, such as different social networking sites, to discuss interests, work, or to socialize (boyd, 2014a; Ito et al., 2009).

The development and projection of an identity online intersects with the development of youth identity offline, impacting the offline personality (Chittenden, 2010). Young, aspiring workers must now be consistently “on brand” across all platforms in both public and private, encouraging the building of one’s entire existence around work and blurring lines between work and non-work (Banet-Weiser, 2012; Gershon, 2014; Gill, 2010; Gregg, 2011; Hearn, 2008; Marwick & boyd, 2011). By engaging in the digital marketplace and shaping identity accordingly, young people are perhaps becoming more “business”-focused at an earlier age.

However, there is a tension between the need to be recognizable as an aspiring worker online by displaying traditional markers of job suitability, while simultaneously demonstrating a distinctiveness, individuality, and authenticity to stand out (Gershon, 2014). Though long standing as a concept within commercial marketing, authenticity has received increased attention recently through marketing exercises, where authentic “amateur” productions are seen as more real, and thus, more valuable for companies that want audiences to “relate” to their product (Banet-Weiser, 2012; Botterill, 2007; Duffy, 2013; Keen, 2007; Rettberg, 2008). As Rose and Wood (2005) note, “Consumers increasingly value authenticity in a world where the mass production of artifacts causes them to question the plausibility of value” (p. 286).

Authenticity has thus become a desirable aesthetic for young aspirational laborers, particularly for bloggers who want to remain “relatable” to their audience while distancing themselves from the market-driven environment they are engaged in (Duffy, 2013, 2015; Hesmondhalgh & Baker, 2011; Hopkins & Thomas, 2011; Jenkins, 2006; Kuehn, 2016; Marwick, 2013; McQuarrie et al., 2013; Salisbury & Pooley, 2017; Sherfin, 2004). This has led to what Pooley (2010) terms “calculated authenticity,” where identities

are strategically curated to be “authentic” for the purposes of self-branding. It requires a constant extension of what Hardt and Negri (2000) call “affective labor,” whereby individuals must display enthusiasm for the work they are doing regardless of reality. Additionally, the use of seemingly genuine connections to further a career can result in the instrumentalization of relationships (Duffy, 2016; Hearn, 2010; Kennedy, 2009).



4. ASSESSING THE TRUE COST: DOWNSIDES OF ASPIRATIONAL LABOR

Alongside these benefits are clear downsides for young people engaging in aspirational labor. First, is the rationalization of inherently unfair labor conditions through both the rhetoric of “passion” (Arvidsson, Malossi, & Naro, 2010; Duffy & Hund, 2015; Postigo, 2009) and the focus on future rewards over present circumstances (Daniel & Daniel, 2013; Daugherty, 2011; Frenette, 2013; Neff & Arata, 2007; Siebert & Wilson, 2013).

The “do what you love” philosophy that drives aspirational labor implies that passion and dedication will be rewarded in a meritocratic system (Duffy, 2015). However, this mentality obscures inequalities regarding class, race, ability, and education (Margolis, 2018; Tokomitsu, 2014; Watkins et al., 2018). Instead, there remains a strong participation divide within aspirational labor, mirroring the physical sphere in which internships that give people an “unpaid foot in the door” disproportionately go to those with high stocks of capital, both social and cultural (Lee, 2011; Murdock, 2011; Perlin, 2012; Townley & Beech, 2010). The ability to participate is restricted to those who can afford the significant outlay of money and time, naturally precluding many who might aspire to join digital industries (Duffy, 2016; Marwick, 2015) and creating a divide between affluent sectors of youth and the non-affluent. The importance of networks in digital and creative industries also means that the employment benefits from “aspirational labor” are disproportionately awarded to those who are already well connected offline and imbued with considerable

social capital (Lee, 2011; Townley & Beech, 2010). Further, scholars have noted that adherence to traditional ideals of beauty also appears to provide benefits within the system, particularly in visual sectors, such as fashion blogging (Banet-Weiser, 2012; Duffy, 2016; Duffy & Hund, 2015).

The myth of “universality” — that aspirational labor can be a viable route for anyone — is further dismantled after consideration of the self-defined “pro-amateur” category. The “pro-amateur” category, a term coined by Leadbeater and Miller (2004), creates a hierarchy within the “amateur” community by promoting certain individuals above others based on success and exposure, mirroring the patterns of a traditional media hierarchy (Chia, 2012; Duffy, 2015). The term “amateur” is not used to mean “one without experience,” but rather “one who is not paid” (Leadbeater & Miller, 2004; Lessig, 2004). Critically, Brabham (2010) has argued that the label of “amateur” is being used by companies to undermine how the work serves their profit motives, allowing them to make use of the work and avoid attention being placed on the individuals as laborers; thus, people deserving fair pay and workers’ rights (Brabham, 2010, 2012).

Problematically, these “pro-amateurs” are held up as models for emulation, suggesting that opportunities to transition into paid work are attainable by anyone, requiring no formal entry requirements for participation. Thus, failure to achieve goals leads to

a situation in which young people blame themselves (Ross, 2013). Further, due to the focus on the self as the protagonist, a “locked in” effect is created, whereby the level of investment (time, skill, emotional labor, effort) acts as a structural disincentive to leave the competition, becoming a sunk cost fallacy. Because of the ongoing rhetoric of employment “serendipity,” being “randomly discovered” can happen at any time, and thus giving up is advised against.

Further undermining this rhetoric of universality is that “pro-amateurs” tend to have formal schooling or qualifications, access to professional resources, work at professional standards (Brabham, 2012; Duffy, 2015; Leadbeater & Miller, 2004), and investments in financial capital. Oftentimes, “pro-amateurs” continue to draw upon notions of “amateur” and “authentic” so as to present themselves as “ordinary” individuals in order to downplay their economic outlay and income, while enabling themselves to create a distinct “space” through which they may enter the traditional industry environment (Banet-Weiser, 2012; Duffy, 2010, 2013, 2014, 2015, 2016; McQuarrie et al., 2013). However, by making money and achieving mass audiences and inclusion within traditional systems, “pro-amateurs” face being labeled a “sell out” due to the seemingly irreconcilable differences between “profit focus” and “authenticity” (Duffy, 2016; Kozinets et al., 2010; McQuarrie et al., 2013).

For example, Chia (2012), studying the economy of blogging, noted that “despite the rousing assurances from guidebooks that anyone can become a pro-blogger, in reality, most blogs languish in digital obscurity.” Across traditional blogs, video blogs, and social media sites, there is a clear hierarchical nature of success in which success is measured by audience size (Abidin, 2016; Marwick, 2015). It is well documented that paid opportunities due to certain marketing and exposure logic increase proportionately as individuals achieve a bigger audience (Abidin, 2016; Duffy & Hund, 2015; Kaytoue et al., 2012; Kozinets et al., 2010; McQuarrie et al., 2013). Mandansky and Arenberg (2008), exploring the disparity in earnings across U.S. bloggers, found that while the top 1% earned more than \$200,000 annually, the median income of the other 99% was merely \$200 annually.

In this framework, the use of the term “followers” as opposed to “friends” to describe an audience reaffirms a performative hierarchy and enables the individual to utilize the audience to achieve personal motivations (Chittenden, 2010). Moreover, the presence of dedicated marketing companies that curate social media profiles, produce professional-level YouTube videos, or attract additional followers creates an element of gamification, turning the system away from meritocratic attention reception (Coté & Pybus, 2007; Duffy, 2016; Lehdonvirta & Ernkvist, 2011).

A further downside is that it appears young people may be devaluing the jobs they want to obtain by supplying the work for free (Kuehn & Corrigan, 2013). Once companies can rely on freely produced digital content, the number of full-time employee positions dwindle and pay drops, becoming an economic race to the bottom (Hofman & Steijn, 2003). Ross (2013), discussing content farms, points out that free labor, in general, has undercut professional wages and job availability. Siebert and Wilson (2013) also argue that unpaid work experience has a negative impact on the labor conditions of workers currently within the industry. Bulut (2015) discussed how, in the case of the video game industry, the presence of a “large reserve army of labor” creates precarity at entry levels by lowering wages and allows more control over the workforce. Reactions from professionals, noted through business and trade publications, are generally negative toward the growth of free labor (Corrigan, 2015; Gollmitzer, 2014; Siebert & Wilson, 2013).

The final question remains as to whether “aspirational labor” is, overall, exploitative. Despite its drawbacks, aspirational labor activities are usually undertaken for enjoyment, as well as the development of skills and networks. However, if aspirational labor becomes an informal but necessary entry requirement, then arguments for exploitation gain greater justification. Similarly, if the processes and manifestations of aspirational labor are encouraged even when there is



no possibility of transition into paid work, then it is again potentially exploitative. Of critical importance is that, in certain cases of aspirational labor, individuals are providing genuine value for companies without compensation. In co-production instances, for example, aspiring designers might provide labor for free but from which companies profit (Andrejevic,

2009, 2013; Boston & Duffy, 2015; Cohen, 2012; Corrigan, 2015; Hesmondhalgh, 2010; Hesmondhalgh & Baker, 2011). When value is extracted by companies in exchange for “exposure” rather than pay, without any sense of intrinsic enjoyment, then it is hard to avoid the claim of exploitation.

5. CONCLUSION

Aspirational labor, in its many forms, is an important element in the discourse surrounding youth engagement in the digital economy and has been given less attention than it deserves. In Staksrud, Livingstone, Haddon, and Ólafsson’s (2009) classification of children’s online opportunities and risks, self-exploitation was not included as a potential risk. Conversely, economic rewards were similarly excluded as a potential opportunity. This dualism of risk and opportunity is nevertheless a prominent feature of adolescence, particularly with regard to the general behavior of youth on the Internet and social networking (Livingstone et al., 2013, 2017; Livingstone & Helsper, 2010; Mascheroni & Olafsson, 2014; O’Neill, Livingstone, & McLaughlin, 2011).

In the face of a flexible and entrepreneurially-driven digital economy, young people desiring career entry into popular digital media professions are being driven toward unpaid online activities, such as vlogging and gaming. However, rather than viewing youth as merely “vulnerable innocents” in need of protection from the risks of the Internet, we should remember the opportunities they are building for themselves. Aspirational labor activities are undertaken for enjoyment, as well as the development of skills and networks. For many young people, these activities are creative outlets and a method of making new friends with similar interests. A side effect of many of these activities is the generation of income, variable in amount but with the potential to result in considerable sums of money.

In addition to present income is the hopeful generation of opportunity. The hope element is important because of the limited nature of this activity. There is a rhetoric of open meritocracy for amateurs: Anyone can succeed if they try hard enough. However, this belies the fact that success is limited to those who have the means to succeed. For example, joining online platforms is initially free except for the outlay of computer equipment, but continuing upward often requires investment in better equipment, online subscriptions, and expensive outlays on travel and/or material consumption. Indeed, the introduction of supplementary economic activity, such as professional photographers and curators of online content, further imbalances the nature of aspirational labor. Thus, such labors are both hopeful and aspirational because success is limited and out of reach to many who aim for it. Nevertheless, the presence of “success narratives” is taken as proof of its efficacy and keeps hope alive for many.

Whether the trade-off of free labor for the hope of future economic rewards is exploitative depends on the viewpoint and circumstances. While it would be easy to view it as objectively exploitative, it can also be viewed as an adaptation to current economic requirements. Youth are not only finding new pathways to current jobs, but are also creating new jobs by themselves.



IV. ESSAY 3 – YOUTH AND VIRTUAL COLLABORATION

Abstract: Over the last two decades, researchers, policymakers, entrepreneurs, governments, and educators have attempted to identify the skills youth need to succeed in a digital world. From technical skills to sociocultural literacies, a range of competencies has been described as necessary for participation in a rapidly changing digital economy. Among the various skills, researchers have identified collaboration as an important interpersonal ability at the basis of many sociocultural and economic interactions (Claro et al., 2012; Jenkins et al., 2009; Levin, 2015; OECD, 2016a). This essay describes how the affordances of new technologies and online platforms – such as synchronous and asynchronous

communication, social interactions, and exchanges – provide youth with an opportunity to develop the skill of collaboration. The Scratch platform is used as a case study to explore how collaboration is practiced by youth ages 8 to 16. We focus on one example of a Multiple Animator Project (MAP) on Scratch to illustrate how youth deploy three levers for virtual collaboration: effective leadership, trust-building, and establishing common ground. In the conclusion, we discuss how practicing collaboration on youth-driven platforms, like Scratch, can support learning, social networking, and cultural production processes that are essential for success in the digital economy.

1. INTRODUCTION

The words “communication” and “community” are both derived from the Latin root *communis*, which means common – underscoring the inextricable link between these two concepts. Watson (1997) explains, “Without ongoing communication among its participants, a community dissolves. Communication re-creates and maintains community through the interaction of participating members” (p. 104). In online communities, youth are learning first-hand the inseparable connection between “community” and “communication” as they socialize with peers and work together to create content. From the dialogue in the

comments section of a YouTube fan video, to a conversation in a Facebook group, or the message exchange in a collaborative project on the online learning community Scratch, youth are leveraging digital and networked technologies to communicate, participate in online communities, and engage in cultural production.

This type of cultural production represents a pervasive form of online activity among youth. In the U.S. alone, nearly two-thirds of teenagers create content online – from blogging to remixing – and approximately one-third of youth share the content they have developed online with others (Lenhart & Madden, 2005). In many cases, this content creation and distribution occurs within the context of a “participatory culture” (Jenkins, 2006). A participatory culture exists in spaces with relatively low participation barriers in which youth can connect with one another, sharing and developing content.



Online platforms and communities have become spaces where youth, particularly those with digital literacy skills and access to technology, can engage in the production of information and become part of a participatory culture, generating content while forging connections (Jenkins, 2006; Trespalacios,

Chamberlin, & Gallagher, 2011). The Scratch platform is a popular environment among youth for these types of activities. By participating and interacting within the Scratch community, working with others to create and share content, youth have the opportunity to collaborate in virtual teams.

2. SCRATCH: AN ONLINE AND YOUTH-DRIVEN PLATFORM

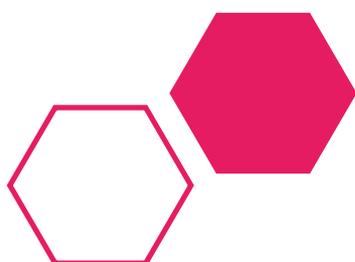
In order to understand how youth are practicing virtual collaboration, this paper focuses on the Scratch online community. Launched in 2007 by the MIT Media Lab, Scratch (<http://scratch.mit.edu>) has become a dynamic social space where youth, mainly between the ages of 8 to 16, create, remix, and share interactive multimedia projects. Although initially designed to serve as a space for sharing the media created with the Scratch programming language offline, the online platform evolved to provide the possibility of coding online using a web editor embedded in the website. The Scratch website allows youth to design and program their own interactive media, such as animations and games, and share these with members from around the world. The online community is home to more than 50,000,000 users with more than 45,000,000 projects shared on the platform (Scratch, 2019).

Scratch is rich in examples of how digital tools and networks are being used by youth to engage in virtual collaboration. From remixing the projects of other members to exchanging knowledge in discussion forums, the Scratch website has been designed in a way that promotes creative collaboration (Aragon, Poon, Monroy-Hernández, & Aragon, 2009; Brennan & Resnick, 2013; Monroy-Hernandez, 2012; Roque, Kafai, & Fields, 2012; Roque, Rusk, & Resnick, 2016). Scratch tools that support this type of collaboration and foster a constructionist learning environment include the comments section of projects where

members can provide feedback and connect with each other, as well as studios or galleries where members can collectively curate projects.

Scratch enables learning based on the collaborative creation of digital artifacts – a learning by doing and experimentation, as well as sharing and working with others (Papert, 1980; Roque, 2012). On the platform, youth create new knowledge through designing their own artifacts, such as a musical animation or a video game. Thus, Scratch can be considered an amateur design community (Fields, Giang, & Kafai, 2013).

A constructionist learning environment also affords youth the opportunity to display, discuss, and collaboratively reflect on the artifacts they create, cultivating individuals' social skills (Hay & Barab, 2001; Stager, 2001). Because all interactions are done on the online platform, many Scratchers have become accustomed to connecting with others through asynchronous computer-mediated communication. Despite the potential challenges that asynchronous communication can create for collaboration, many Scratch members are able to successfully form virtual teams and work together to develop creative content.



3. VIRTUAL COLLABORATION AND TEAMWORK IN SCRATCH

Rapid technological development over the last several decades has ushered in an array of electronic tools individuals can use to communicate with one another. As the quality of these digital technology platforms continues to advance, individuals are increasingly working together not face-to-face, but over computer-mediated environments (Driskell, Radtke, & Salas, 2003). Known by some researchers as e-collaboration, virtual collaboration has been described as the “use of digital technologies that enable organizations or individuals to collaboratively plan, design, develop, manage, and research products, services and innovative IT and E-commerce applications” (Turban, King, Liang, & Turban, 2015, p. 260). Although there are variations in the type of technology and platforms of communication used in online teams, the defining characteristic of a virtual team is that interdependent members work toward a shared purpose while being spatially separated (Driskell et al., 2003).

One of the most important aspects of virtual collaboration is that it has the potential to promote learning (Roque, 2012; Stahl, Koschmann, & Suthers, 2006; Steinkuehler, 2008). Computer-supported collaborative learning (CSCL) has become an important branch of the learning sciences that integrates distance education, computer mediation, and collaboration. According to Stahl et al. (2006), as people work together online and participate in groups with shared goals, they are able to collaboratively construct knowledge. Solving problems, creating digital artifacts, and gathering information on online platforms represent social activities where learning occurs. Virtual collaboration takes different forms on the Scratch online community that vary in scale and purpose. Given the size of the community, some collaborative initiatives involve hundreds of members working together. Role-playing games (RPGs) represent one type of large scale example. In RPGs, members of the community create and share projects about specific characters that are part of a unique story world. The story is built using the studio tool and is open to any Scratcher. To participate, members simply create a character and act out parts of the story within a project or in the studio comments (Roque et al., 2016).

Thus, as different members of the community join the RPG, they contribute to a story world that develops in different directions and across multiple modalities. RPGs, such as [Jellyville](#) and [Color Divide](#), have given rise to hundreds of within-studio projects and comments. These RPGs have become so popular in the Scratch community that their characters and story worlds have expanded beyond the original RPG studio and turned into new RPGs (known in the Scratch community as Sagas) and other interactive projects, such as magazines, fan clubs, and spin-off stories.

In contrast to the large-scale collaboration that characterizes these RPGs, there are also initiatives that involve smaller groups of Scratchers working together. Two examples of this type of collaborative work include companies and multiple animator projects (MAPs) (Aragon et al., 2009; Monroy-Hernandez, 2012; Roque, 2012). Companies, for instance, are self-organized groups of Scratchers that work together across a range of projects, assuming different roles and tasks, as well as setting up shared goals. Also known as “collabs,” companies are formed by leveraging the studio tool and setting up specific goals related to the production of a particular kind of project (e.g., animation, video game, or drawing). The founder of the company creates the studio page, invites other Scratchers to join, and explains the roles and tasks in the studio description. The comments section of the studio is used to coordinate tasks among the company members.

In MAPs, a self-organized small group, ranging from 12 to 40 participants, works together to produce an animated music video (Aragon et al., 2009; Roque, 2012). In contrast to companies and RPGs that organize their activities leveraging the affordances of the studio tool, MAPs are organized within a Scratch project that is carefully prepared by the MAP host. As a leader, the MAP host assumes the role of a coordinator and is in charge of choosing the music (usually a popular song) and theme, as well as creating segments of the project that can be assigned to other collaborators. The host is also responsible for promoting the MAP within the Scratch community,

recruiting participants, creating a set of rules that needs to be followed by all the collaborators, and establishing deadlines for the project.

MAPs have become highly popular in the Scratch community. Hundreds of MAPs have been created by Scratchers exploring themes as diverse as fandoms (e.g., Doctor Who, Undertale, and Gravity Falls), alternate universes, civic causes, parodies, and animation styles. Although thousands of MAPs have been created, only a few have been fully completed. Some of the most popular completed MAPs are “Everything Stays,” “Scars to Your Beautiful,” “Harry Potter,” “EARTH DAY,” and “Abstract Animation.”

There are certain commonalities among all the different types of virtual collaboration on the Scratch online community. First, collaboration on Scratch is based on asynchronous communication; members cannot communicate in real time or concurrently. Second, the language used for communicating is

primarily English. Third, members engaged in virtual collaboration are dispersed geographically and rarely meet with each other face-to-face. Fourth, all forms of virtual collaboration are supported by the shared values of the Scratch community that are clearly stated in the community guidelines: “Be respectful, be constructive, share, keep personal information private, be honest, and help keep the site friendly” (Scratch, n. d.).

As a youth-oriented platform that supports program and design learning in an online community, Scratch represents an innovative space for virtual collaboration. However, not all collaborative projects in Scratch are successful. As Monroy-Hernandez (2012) notes, like a multitude of free software projects and other commons-based peer production initiatives, many collaborative projects in Scratch do not work as expected.

4. CASE STUDY: “HANDS FOR ORLANDO,” A MULTIPLE ANIMATOR PROJECT

A case study of “Hands for Orlando,” a successfully completed MAP developed by 38 Scratchers, allows us to understand how youth deploy three different levers of collaboration: 1) effective leadership; 2) trust-building; and 3) cultivating common ground.

Background

On July 6, 2016, a Scratcher from the U.S., who goes by the name of Ash on the platform, shared the project “Hands for Orlando.”¹⁰ Ash invited other Scratch members to contribute through advertising the project on several studios dedicated to MAPs and on their Scratch profile page. This was the fourth MAP project that Ash hosted on Scratch. In the span of 10 months, he/she successfully completed three other MAPs: Youth, Immortals, and Perfect Together. Despite being relatively new to the

Scratch community, Ash had earned a reputation as a talented and creative programmer, animator, and MAP host and cultivated a network of more than 1,000 followers.

As the MAP host, Ash framed the project as a tribute to the victims of a tragic event: the shooting at Pulse nightclub in Orlando, Florida, on June 12, 2016. The MAP had a clear civic theme related to diversity, peace, tolerance, and LGBT equality. When describing the rules of the “Hands for Orlando” in the project Notes and Credits section, Ash stated, “This MAP is honoring the victims of a terrible tragedy.”

The MAP was inspired by the song “Hands” written by Justin Tranter, Julia Michaels, and BloodPop and recorded into a charity single by 24 famous artists, such as Britney Spears, Jennifer Lopez, and Pink. The

¹⁰ All Scratch user names in this case study are pseudonyms and have been changed in order to protect the identity of the users.



song was made available to the public as a digital download on July 6, 2016 – the same day that Ash started the MAP. By launching the MAP the same day that the song was released, Ash was able to emphasize the importance of honoring the victims and creating a tribute as a gesture of solidarity. In the description of the project, Ash wrote, “I thought that if these inspirational artists could come together to make this touching song for Orlando, we Scratchers could put together something for them too. <3.”

Given that the MAP was launched the same day “Hands” was released, Ash worked quickly to spread the word among their followers and friends on the Scratch community, establish project goals, and assign tasks to contributors. A total of 37 animators from the Scratch community spread across the U.S., Canada, and the U.K. joined “Hands for Orlando,” choosing different parts of the song and creating 10-second short animations for each segment. Ash, as the MAP host, was in charge of collecting all animated segments, stitching them together, and assembling the complete animation. On September 16, 2016, Ash published the completed animation on the Scratch website (<https://youtu.be/etIFpu20wEs>) and shared a video of the project on YouTube.

The following section, “Levers for Virtual Collaboration,” explains how Ash and the “Hands for Orlando” MAP members successfully worked together to create this animation, employing three levers for virtual collaboration: effective leadership, trust-building, and establishing common ground.

Levers for Virtual Collaboration

Effective Leadership (Unification and Tasking)

Leaders of all teams, whether virtual or collocated, often face the challenge of balancing leader direction with team member participation. Efforts to manage this complex role often lead to negative leadership reactions, such as role conflict (Manz & Sims, 1987) and concerns about appearing ineffectual (Manz, Keating, & Donnellon, 1990). These challenges are amplified by the computer-mediated nature of virtual collaboration. Collocated team leaders can utilize physical observation, leveraging cues, such as gestures or facial expressions, to understand when members need further clarification or when there is a need to rebuild team momentum (Malhotra, Majchrzak, & Rosen, 2007). The lack of face-to-face communication inherent in virtual teams restricts a leader’s capacity to track members’ performance and balance the fine line between direct guidance and member discretion (Huang, Kahai, & Jestic, 2010).

To address the challenge of establishing effective team leadership, virtual leaders can focus on task-related skills, such as creating a shared team vision to mobilize efforts, as well as assigning members’ tasks and roles (unification and tasking, respectively). As virtual teams often consist of individuals of a variety of backgrounds, members typically do not hold shared norms and approaches for completing work (Kirkman, Rosen, Gibson, Tesluk, & McPherson, 2002). Similar to effective leadership in collocated teams, at the outset, a competent team leader can help cultivate cohesion through presenting a unified team goal and a set of norms for collaboration and knowledge sharing (Huang et al., 2010). Effective virtual team leaders must also clearly articulate individual member tasks, provide regular feedback and guidance, and ensure follow-through on these assignments (Kayworth & Leidner, 2002).

In the case of the “Hands for Orlando” MAP, the host, Ash, successfully led a virtual team of 37 youth distributed across three continents and helped them work together to produce an animated video (04:29). He/she was able to effectively leverage the affordances of the Scratch online platform to organize the tasks and roles of all the participants of the project. Additionally, as a leader, he/she utilized the lever of unification, defined a compelling common goal for the project, and articulated shared values.

To organize unification and tasking efforts, Ash used the Notes and Credits section of the original “Hands for Orlando” project. This section allows creators to publish textual information on a column that is next to the Scratch project display. Ash wrote text in English, precisely communicating the specific project objectives, and the overarching goal of the MAP: “I thought that if these inspirational artists could come together to make this touching song for Orlando, we Scratchers could put together something for them too. <3”.

As the overall project objective illustrates, the main goal of the MAP was to create a collaborative animation with an accompanying song that would serve as a homage to the victims of the Orlando tragedy. The timely selection of this theme allowed Ash to create a compelling narrative that could motivate many Scratchers to work toward a meaningful, shared goal (unification).

Ash also wrote a list of 16 rules. Although most of the rules referred to specific animation tasks that participants were responsible for, some rules denoted the shared values of the project and reinforced objectives. In the 11th rule, for example, Ash wrote, “Be thoughtful. This MAP is honoring the victims of a terrible tragedy.” And in the 13th rule: “Animate from your heart <3”.

Moreover, Ash was able to exercise task-oriented leadership by clearly defining, assigning, and organizing group member assignments. As other Scratchers have done when hosting MAPs on the Scratch community, Ash started the project by cutting the music into several short sections (40 in total). Scratchers participating in the MAP would then select specific segments to animate. In this way, Ash was able to assign different parts of the project to specific animators.

The rules that Ash included in the Notes and Credits section were also crucial for organizing the tasks of the 37 animators that participated in “Hands for Orlando.” Ash specified the deadline for completing the animation (“Deadline is preferably within the next [two] months, but try to get it in before August!”), stated some parameters for the animation (especially pointing out the styles to avoid: “Try to refrain from using stick figures”; “No blood / gore”; “do NOT use effects”), and noted several technical issues that animators needed to consider. By precisely specifying tasks and explaining the team’s overall vision and norms at the start of the project, Ash successfully worked to create a unified virtual team where members had a clear understanding of project goals and individual assignments.

Trust-building

Trust-building is an essential lever of virtual collaboration. The development of trust within teams, whether virtual or in-person, rests upon both cognitive and affective trust (McAllister, 1995). Cognitive trust is based upon one’s perceptions of another’s integrity and reliability, while affective trust is built upon members’ socioemotional ties with one another (Lewicki & Bunker, 1995). An atmosphere of trust promotes group learning, allows teams to manage conflict and reach consensus more effectively, and increases creativity (Brahm & Kunze, 2012; Hasler-Waters & Napier, 2002). Team members who fail to cultivate trust are less likely to exchange ideas and information, resulting in lower quality performance (Zand, 1972).



In virtual teams, like collocated teams, members can develop cognitive trust through reliable performance and frequent communication (Jarvenpaa & Leidner, 1999). Prompt communication is particularly important in a virtual environment. Silence or lags in response may be misinterpreted by others as a lack of commitment or ability, which can result in slower development of cognitive trust and harm already-established trust at any stage of group work (Greenberg, Greenberg, & Antonucci, 2007). To encourage member communication and participation, leaders and other members should acknowledge each other's contributions and feedback with positive encouragement (Greenberg et al., 2007).

This capacity to support team members and their ideas also ties into the development of affective trust. Members of teams that exhibit high levels of affective trust work to create a supportive environment by frequently offering positive and motivational messages to one another (An, Kim, & Kim, 2008). Members can cultivate affective trust through performing extra role behaviors, such as providing other members with guidance on tasks and working extra hours to ensure a project is completed (Webber, 2008). Individuals on online teams can also develop this type of trust through socioemotional communication, such as using emoticons and casual language. An atmosphere of trust helps to create strong bonds among individuals and promotes the exchange of information and ideas. During the production of "Hands for Orlando," participants were able to successfully build trust in two main ways: through the exchange of socioemotional content via text-based messages, and reliable performance and frequent communication.

In order to build trust and bonds among the virtual team that produced the MAP, participants exchanged text-based messages that provided social and emotional cues. As the Scratch platform does not provide tools for synchronous communication, Scratchers had to leverage the affordances of the Comments and the Notes and Credits sections of their projects to initiate and sustain dialogue.

Participants wrote messages to each other in these sections, where they could signal their emotions and simulate a social presence.

Ash, as MAP leader and host, frequently wrote positive messages in the comments of each animation that were created for the MAP. In almost all of the messages, he/she used the word "love," a textual emoticon, and an exclamation mark. For instance, Ash wrote to the U.S.-based Scratcher Riverlight in the comments of Part 9: "Oh my gawd I love it! <3." Addressing Cameron99, another Scratcher from the U.S., Ash wrote, "Ahhh this is great!! Thanks so much for entering!! <3."

Using text, Scratchers reciprocated this socioemotional sentiment and conveyed their gratitude for, and engagement with, the collaborative project. For example, Cameron99 responded, "Thanks :D" and Dana11, "huurrinnkkkadinkkk, thank you! ~~~." The use of textual emoticons represents an effective form of socioemotional communication because it provides cues that generate social context and support social relationships (Aragon et al., 2009).

In addition to socioemotional, affect-based trust, group members cultivated cognitive trust through their reliable performance and consistent communication. Given that the MAP was completed in two months, this collaborative effort represents a strong example of team members' ability to efficiently complete tasks in a timely fashion despite their geographic distribution and lack of face-to-face interaction. As further evidenced in the next subsection, Ash was able to successfully create a dialogue with members, offering feedback and guidance to them, and, in turn, members provided thoughtful and prompt responses. This bidirectional communication pattern, coupled with members' ability to successfully complete the project, promoted cognitive trust within this virtual team.



Establishing Common Ground

Establishing common ground means developing an efficient dialogue in which participants have a clear and mutual understanding of group goals and tasks. In the successful development of “Hands for Orlando,” participants of the project established common ground by communicating through both the comments and the Notes and Credits section. As noted previously, all communication was asynchronous, in written text, and in the English language.

After each group member completed their designated animation, they published their work as a single Scratch project on the online platform. In the Notes and Credits of their projects, they wrote a public message in which they explained how they completed their task and provided additional information about their project. Group members also thanked Ash for starting the MAP. In a certain way, these messages were a continuation of a dialogue that Ash had started (through the creation of detailed rules in the Notes and Credits section of the original “Hands for Orlando” project). For instance, the Scratcher Eli24 seemed to be directly responding to Ash’s rule (“Animate how you interpret this song, whether it be coming together as one world, gun control, love is love, etc.”) when she wrote, “Not my best work, but I kinda like it’s simplicity! I read into the lyrics which is how I came up with the whole ‘hope’ thing. All art by me, except the hands shown in the thumbnail.” Thus, the Notes and Credits section of Scratch projects represents one tool that Scratchers leverage to establish mutual understanding among community members.

When the conversation between the team leader or MAP host and the participants needed to expand beyond the two exchanges in the Notes and Credits sections, Scratchers relied on the comments section of their individual projects. Ash was able to directly reply to members’ comments and continue the dialogue. For instance, Jordan7000, a Scratcher from Canada who completed the animation of Part 7, wrote in

the Notes and Credits section, “It’s done! thanks Ash! I hope you like!” Ash replied in the comments of the user’s individual project, providing positive feedback: “AHHH THE ART IS SO GOOD OMG.” After Jordan7000 wrote back to him (“really! I thought it was pretty darn bad.”), Ash was able to give more instructions and advice. The MAP host wrote, “Just remember to add more animation~ But it’s looking great so far!!” The practice of providing positive feedback first and then following up with more detailed instructions proved to be highly effective, and Ash used this technique with a number of Scratchers throughout the project. Thus, effective communication across both the Notes and Credits and Comments sections allowed participants of the “Hands for Orlando” MAP to establish common ground and successfully engage in virtual collaboration. Although the leader and host of the MAP, Ash, was the most active participant across all the project’s dialogue, other participants were also engaged. Additionally, the positive feedback that Ash gave to all the group members created a supportive environment. The use of words such as “love,” “great,” and “thanks” used by the MAP host helped to cultivate a space in which the contributions of all participants were valued. In the same way, all the virtual team members initiated a dialogue with the project host, expressing their excitement about the project and thanking the host and leader for starting it.



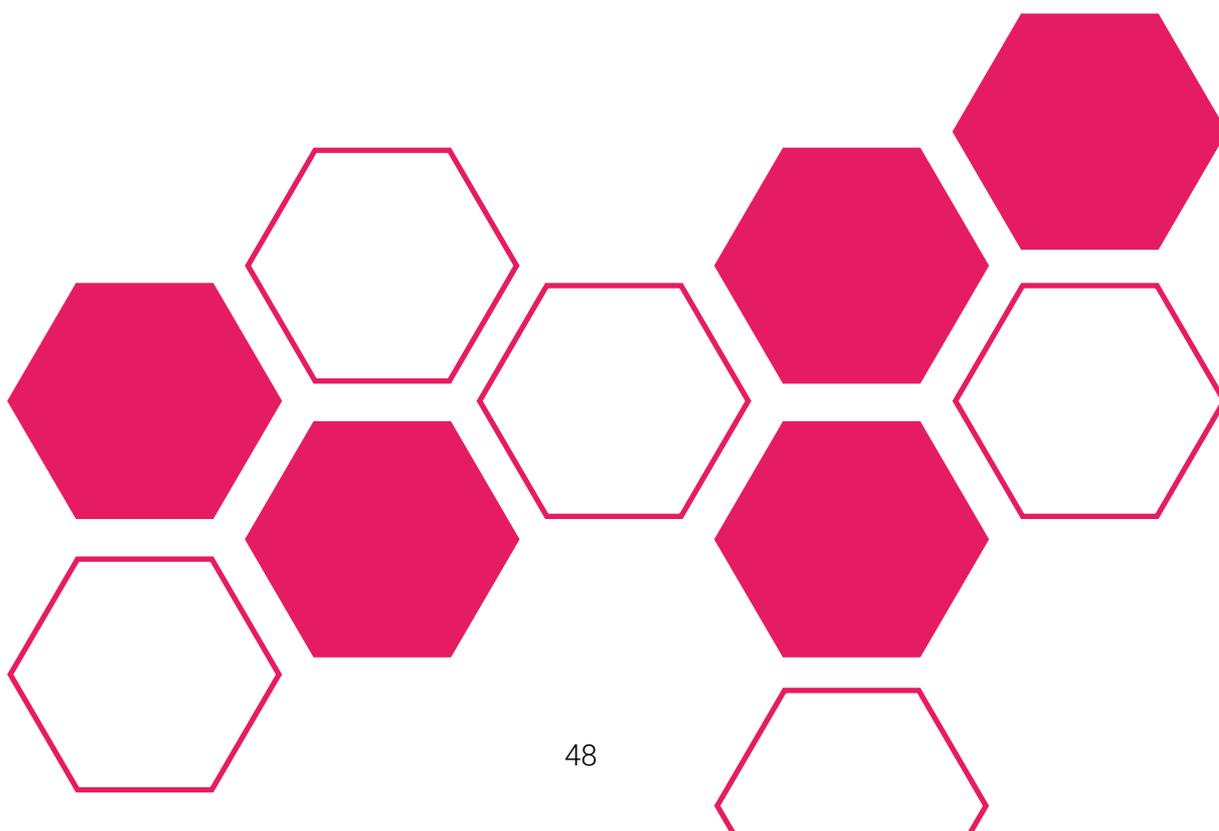
5. Conclusion

Online communities represent vibrant sociocultural spaces where youth may have the opportunity to leverage the affordances of computer-mediated communication while participating in virtual teams and pursuing common goals. By working on projects such as the “Hands for Orlando” MAP, youth encounter opportunities to engage in cultural production and practice virtual collaboration with their peers. As the case study of this project demonstrates, youth deployed three levers of effective collaboration – leadership, trust-building, and establishing common ground – to successfully create an animated video. Using the features of the Scratch platform, 38 youth across four continents engaged in virtual collaboration for two months and created a multimedia artifact as a homage to the victims of the Pulse nightclub tragedy.

Despite the challenges asynchronous and computer-mediated communication creates for effective leadership, trust-building, and cultivating common ground, youth leveraged the tools of the Scratch website to achieve a shared goal. The 38 participants of “Hands for Orlando” used the Comments and the Notes and Credits sections of the individual Scratch projects to communicate with each other, exchange text messages, and provide social and

emotional cues to each other. In this way, they were able to signal their emotions and simulate a social presence regardless of the fact that all of them were distributed geographically across four continents. Furthermore, leveraging these sections of the Scratch projects, the host and leader of the MAP exercised effective leadership by assigning tasks and roles and articulating a common and unified objective.

Online collaboration, as illustrated by this case study, requires a mix of both technical and interpersonal skills. As youth-oriented online learning communities continue to proliferate, additional research is needed to paint a more nuanced picture of the challenges and opportunities of these various virtual platforms. For example, how do youth themselves view the obstacles and opportunities of online collaboration? In what ways can virtual platforms be improved to facilitate coordinated work? Further advancing the field will provide parents, educators, and policymakers with a better understanding of how youth are leveraging digital and networked technologies to explore, create, and learn in online communities.



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