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Education 3.0 and Internet Governance: A New Global Alliance for Children and Young People's Sustainable Digital Development

Divina Frau-Meigs and Lee Hibbard

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A NEW GLOBAL ALLIANCE FOR CHILDREN AND YOUNG PEOPLE'S SUSTAINABLE DIGITAL DEVELOPMENT

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ABOUT THE GLOBAL COMMISSION ON INTERNET GOVERNANCE

The Global Commission on Internet Governance was established in January 2014 to articulate and advance a strategic vision for the future of Internet governance. The two-year project conducts and supports independent research on Internet-related dimensions of global public policy, culminating in an official commission report that will articulate concrete policy recommendations for the future of Internet governance. These recommendations will address concerns about the stability, interoperability, security and resilience of the Internet ecosystem.

Launched by two independent global think tanks, the Centre for International Governance Innovation (CIGI) and Chatham House, the Global Commission on Internet Governance will help educate the wider public on the most effective ways to promote Internet access, while simultaneously championing the principles of freedom of expression and the free flow of ideas over the Internet.

The Global Commission on Internet Governance will focus on four key themes:

- enhancing governance legitimacy — including regulatory approaches and standards;

- stimulating economic innovation and growth — including critical Internet resources, infrastructure and competition policy;

- ensuring human rights online — including establishing the principle of technological neutrality for human rights, privacy and free expression; and

- avoiding systemic risk — including establishing norms regarding state conduct, cybercrime cooperation and non-proliferation, confidence-building measures and disarmament issues.

The goal of the Global Commission on Internet Governance is two-fold. First, it will encourage globally inclusive public discussions on the future of Internet governance. Second, through its comprehensive policy-oriented report, and the subsequent promotion of this final report, the Global Commission on Internet Governance will communicate its findings with senior stakeholders at key Internet governance events.

www.ourinternet.org

ABOUT THE AUTHORS

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Lee Hibbard is the co-ordinator on Internet governance at the Council of Europe, which is an international organization comprising 47 countries, set up to promote democracy and protect human rights and the rule of law in Europe. He is responsible for the Council of Europe's Internet Governance Strategy 2016–2019, including the setting up of a platform between governments and major Internet companies on their respect for human rights online. In recent years, Lee facilitated public policy on a range of issues including human rights for Internet service providers, network neutrality, freedom of expression on the Internet, and the empowerment and protection of children online.

ACRONYMS

UNAOC	UN Alliance of Civilizations
C4D	Communication for Development
CLEMI	Centre de Liaison de l'Enseignement et des Médias d'Information
CNNum	Conseil National du Numérique
CoE	Council of Europe
CRC	Convention on the Rights of the Child
CSR	corporate social responsibility
GigaNet	Global Internet Governance Academic Network
ICT	information and communication technology
IGF	Internet Governance Forum
IT	information technology
ITU	International Telecommunication Union
MIL	media and information literacy
MOOCs	massive open online courses
NGO	non-governmental organization
OECD	Organisation for Economic Co-operation and Development
SDGs	Sustainable Development Goals
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNICEF	United Nations Children's Fund
WISE	World Innovation Summit for Education
WSIS	World Summit on the Information Society

EXECUTIVE SUMMARY

We need Internet governance in education.

– Nordic Youth Delegation, European Dialogue on Internet Governance, 2012

Children and young people are increasingly reliant on the Internet for their everyday lives. They communicate, share and collaborate online; use it to learn and play; and recognize its importance for their adult working lives. Considering their increasing access, agency and autonomy in using content and services, their protection as a vulnerable group needs to be coupled with their education as emerging citizens to ensure they develop a healthy and positive relationship regarding the Internet. Their general well-being, participation in society and prospects of employment greatly depend on media and information literacy (MIL) as the new set of basic skills for the twenty-first century, where computational thinking interfaces with the rich and diverse "cultures of information" (news, data, documents, codes and so on).

This paper examines education and its digital transition, mindful of the post-2015 Sustainable Development Goals (SDGs) of the United Nations. It discusses a variety of perspectives and trends, arguing that the future of education should be part of the global debate on Internet governance. It posits that Internet governance offers a new form of legitimacy for children and young people to go beyond their current "protected" status. Active participation in Internet governance can empower them to become actors in policy deliberations. This can be achieved by developing a "frontier" field integrating existing Internet studies with MIL, redefined to comprise Internet governance principles, protocols and processes. This new field can be integrated into the school curriculum as a key discipline. Such a digital transition from education 2.0 (where information and communication technology [ICT] are support tools) to education 3.0 (where MIL and Internet governance are the new basics) can provide children with competencies for cooperation, creativity and social innovation. It can also nurture their human rights and understanding of shared values, which, in turn, will help to build more inclusive societies.

As a global resource managed in the public interest, the Internet depends not only on policy makers and decision makers, but also on education leaders, on the adults around children and, most importantly, on children themselves. Mindful of children's cognitive development, cultural differences in the conceptualization of childhood and children's exposure to all sorts of materials and resources online, this paper explores the mutually reinforcing opportunities for both children and the multi-stakeholder Internet community through their alliances in education and Internet governance.

This paper also considers the risks of inaction in the transition to education 3.0. It draws attention to a crucial element for effective change: the need to raise awareness and to support teachers, students and public authorities alike to embrace the notion of education 3.0, to consider the tools and resources needed (e-learning, data analytics, massive open online courses [MOOCs], and so on) and to engage in the phased adjustments needed at all levels of its governance. Incremental, scalable, step-by-step change is key to success in the education sector, which has already experienced many "computer-in-the-school" plans with mixed results. Education 3.0, based on pedagogy for participation and "co-design" as collaborative problem solving, buttressed on human rights and shared values, provides a comprehensive vision that can engage all actors at their level of interaction.

Divided into three main sections, the paper starts by addressing the gaps and opportunities for schools by making MIL, digital and scientific humanities, and network

and data analytics, combined with human rights and shared values (i.e., NETmundial's Internet governance principles and processes), part of the basic national curricula. It then goes on to consider the evolving ecosystem of state and non-state actors, such as libraries, the private sector and the creative industries, that stimulate training and learning around and beyond the education system. The third section concerns the Internet governance of education, with regard to the relationships between children and the providers of commercial Internet content and services, the legitimacy of young people to participate in Internet governance policy dialogue and policy making, and the vital role of the public sector to develop and stimulate innovation policies to benefit children and young people. Finally, the paper underlines the overarching importance of children's sustainable digital development and the need to foster their well-being, capabilities and prospects for the future.

Aligned with the implementation of the post-2015 SDGs of the United Nations, there are a number of milestones that need to be set:

- Education 3.0 responds to the crucial needs of children and young people concerning their citizenship, capacity building and employability. This requires that, in a minimum number of national curricula across continents, MIL (including Internet studies) is introduced as a core discipline in the education systems of schools.

- Education 3.0 addresses children's level of autonomy and empowerment on the Internet. This recognizes that their online agency is higher than it is off-line (i.e., starts from a younger age). Part of this response means transforming the activities of "solo kids" online into the collective efforts of young people with advocacy skills who can both express themselves and assemble and associate, as part of the exercise of their human rights.

- The Internet governance multi-stakeholder community supports the sustainable digital development needs of children and young people. This implies that a minimum number of national, sub-regional, regional and global Internet governance spaces are created and mobilized that engage and recognize the voice of children and young people in the dialogue and design of Internet governance policies.

These milestones should be discussed and coordinated at the international level by the United Nations, in particular by disseminating this paper and using its proposals to organize dialogue across continents. To this end, the creation of the position of UN Special Rapporteur on education 3.0 for children and young people's sustainable digital development could help to coordinate and promote coherent and dynamic engagement of all stakeholders, which facilitates a shared vision in and beyond education as put forward in the 10 recommendations of the paper.

INTRODUCTION

The Internet is rapidly transforming the world's economic, cultural and social environment. There are numerous examples of its impact on connected users and their communities, in the Global North as well as in the Global South. The Internet's irreversible presence as a driver of economic, social and political development has profound implications for those who can or cannot take advantage of its opportunities. The industry is gearing up to the next billion Internet users, making education key. Yet in global Internet governance debates, the theme of education is barely acknowledged, as if this sector was still untouched by Internet evolutions and still under a latent subsidiarity principle that makes it the prerogative of states. In fact, in a globalizing environment, transnational corporations specializing in information technology (IT)-based education are encroaching on this highly subsidized public service. When mentioned, the scope of education is either narrowly reduced to compulsory education or broadly defined to include capacity building and lifelong learning.

In addition, children do not appear as a stakeholder group in Internet governance.[1] When decisions about their online lives are made by adults, they mostly concern protection from harm, as children are construed as a vulnerable group.[2] This is in deep contrast with their screen time, which begins at ever younger ages.[3] This also does not take into account the increasing numbers of children who access the Internet via multiple devices. Indeed the precise numbers of children worldwide who are accessing the Internet is difficult to ascertain. In 2013, the International Telecommunication Union (ITU) focused on digital natives (15–25, with several years of experience in using the Internet), and found that: "In the developing world, the proportion of 15–25 year olds using the internet is more than double that of other age brackets…Overall, digital natives represent just 5.2% of the world population (approx. 36 million worldwide)" (ITU 2013; see also Livingstone, Carr and Byrne 2015). Taking into account a similar number of children between zero and 15, these data taken together indicate that an estimated 600 million young people are concerned, out of a global population of approximately 3.5 billion users (and 7 billion people worldwide, 1.7 billion of whom are under 15). These large

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1   In the World Summit on the Information Society (WSIS) Tunis Agenda, children are not mentioned as a stakeholder group; however, they are referred to as being in need of protection in paragraph 90.q.

2   Internet Governance Forum (IGF) and EuroDIG workshops in Vilnius (2010) and Stockholm (2012), respectively, dealt with child protection and risk management. Note also IGF meetings in Sharm-el-Sheikh (2009) on child protection, data privacy and freedom of expression.

3   A Common Sense Media study looked at the media use of children aged zero to 8. See http://digitalkidssummit.com/2014/09/29/72-of-american-children-0-to-8-years-use-mobile-media-revisiting-common-sense-medias-2013-report/.

numbers signal the urgency of the task ahead, as younger and younger children go online with more frequency. This is especially the case for developing countries (in Africa, Asia and Latin America), where Internet access and use are most likely to take place in years to come, and where the digital divide persists, aggravated by the global migrants crisis.

This paper examines education and its digital transition from education 2.0 (where ICTs are support tools) to education 3.0 (where MIL and Internet governance are the new basics), in line with the post-2015 SDGs. It posits that Internet governance offers a new form of legitimacy for children and young people, whose curiosity and resilience mitigates their current "protected" status. Active participation in Internet governance can empower them to become actors and not only subjects of policies. This can be achieved by developing a frontier field integrating the existing Internet studies with MIL, redefined to comprise Internet governance principles, protocols and processes. This new field can be integrated in the school curriculum as a key educational discipline. Such a digital transition to education 3.0 can provide children with competencies for participation, cooperation, creativity and social innovation. This, in turn, can lead to their individual and collective well-being (Frau-Meigs 2013b).

Consequently, in a holistic, systemic manner, the paper proposes both a short-term strategy for children's immediate role in the governance process and a long-term strategy to prepare children to face a digital world, with MIL and education 3.0 at the core, which will, in turn, reinforce their role in the governance process. Hence the paper is organized in two parallel tracks that consider the multi-stakeholder governance within education, on the one hand, and the Internet governance ecosystem outside education that can impact positively education 3.0, on the other hand. These two tracks of education and Internet governance should not ignore each other any more as they are potentially mutually reinforcing.

Based on the definition contained in the 2005 report of the Working Group on Internet Governance,[4] this paper is inspired by the current Internet governance ecosystem of actors and events, in particular the WSIS, the IGF and NETmundial, which have helped to establish a consolidated list of principles and processes from which it is possible to build policy.[5] The main Internet governance processes are considered to be multi-stakeholder, open,

consensus driven, transparent, accountable, inclusive and equitable, distributed, collaborative, and enabling of meaningful participation (including involvement from non-technical civil society). The core principles currently posited are universality, openness, interoperability, neutrality and diversity (Frau-Meigs 2012a).

The challenge is to establish the level of agency and autonomy of young people. There is considerable slippage between the categories of children, youth and minors. In the north, three major categories seem to be accepted, in terms of cognitive development: 0–8 (young children), 8–12 (pre-teens) and 13–17 (teens). There is a fourth category looming in the background: young adults (18–25), who are still very much considered as part of the millennial generation because they share similar characteristics to younger cohorts in their uses and expectations of the Internet. In the south, the conceptualization of childhood is non-linear and less driven by developmental psychology. In India, Southeast Asia and some African countries, for example, the life cycle has three or four broad phases, and childhood extends to young adulthood as a period of protracted learning (Asthana 2012). Children have responsibilities in the south that are not even considered in the north, where they are much more protected for a longer period. Considering children first and foremost also relates to the changing notion of family, which is encompassing new parenting combinations worldwide (nuclear, extended, recomposed, and so on), where children are not always nurtured by a close circle of caretakers around them.

That said, in both the north and south, the boundaries of childhood are also being renegotiated, in part because providers of online content and services establish ages for access and use in their agreements. Because most global platforms are US based or aligned with US practices, the major online threshold is actually determined by the permitted age of access to social networks, largely established at 13; this age restriction rule appears in the US Children's Online Privacy Protect Act.[6] This threshold can conflict with state regulations or laws about the age from which children can use services in many other countries, in particular in schools.

Taking this range of online childhoods into account in a holistic manner, children must be considered as having agency and responsibilities from an earlier age, while still needing to be protected from risks of different kinds. The unprecedented degrees of exposure to all sorts of materials and resources online are an additional element to take into account: in most countries, children have access to content traditionally reserved for adults, be it harmful content (such as violence and pornography) or specialized high-level content with abstract information. This can impinge on the latency of childhood, while, however, creating new

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4 "Internet Governance is 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 programmes that shape the evolution and use of the Internet" (Working Group on Internet Governance 2005, 4, paragraph 10).

5 The NETmundial process is a consolidation of prior events and discussions. See http://netmundial.br/wp-content/uploads/2014/04/NETmundial-Multistakeholder-Document.pdf.

6 Its extension to a new category of "minors" (between the ages of 13 and 15) is being debated in the Do Not Track Kids Act of 2015.

opportunities for access to learning. Availability of media, in particular ICT-driven media, is a critical multiplier for primary degree necessities, such as food and hygiene. Second-degree necessities, also called "functionings" (Sen 1985), such as access to education and media, foster self-esteem and well-being, even in harsh poverty-stricken circumstances because their value is dependent on the choices of the young people actually concerned, in their local circumstances. These functionings lead to real freedoms or "capabilities" that in turn foster the capacity for participation in community life and civic agency, at very early ages (ibid.). Consequently, development needs to be considered in the double meaning of the word: the development for children's individual well-being, and the development of collective sustainable well-being in a globalized world.[7]

MAINSTREAMING WELL-BEING THROUGH INTERNET GOVERNANCE PRINCIPLES IN TWENTY-FIRST-CENTURY EDUCATION

Countries worldwide are asked to make a rather brutal transition effort from analogical, pre-digital structures to digital ones. And this transition is not "transitory": the nature of digital technologies, based on networked production and collaborative innovation, is in constant evolution. This process requires acculturation to the realities of the online world. Mainstreaming well-being implies ensuring that the issues relevant to young people respond to their needs and capabilities, and are buttressed to Internet governance principles that are translated into age-relevant rules and practices.

This effort points to a great need for inclusion: the digitally excluded are not so just because of economic conditions, but also because of age, gender and lack of literacy skills to fully benefit from Internet access when they have it. They are at risk of being left behind. The lack of training and attendant degrees and the lack of familiarity with digital processes can lead to different forms of exclusion from society (Conseil National du Numérique [CNNum] 2013). This pattern has implications for the perceived usefulness of the Internet and the appreciation of its benefits and of its relevance for local functionings and sustainability. It also affects the engagement of young boys and girls in Internet activities for uses other than entertainment, such as education, career goals and job training.

The Internet-poor are no longer the digital "immigrants" of the early 2000s, when Marc Prensky (2001) coined the catchy phrase that opposed them to digital "natives." This metaphor may have applied to the early stages of the Internet but it needs to be revisited. Today's reality is that children are both native and naïve given the advantages of easy adaptation to the technology and the limitations of self-taught learning online. Their skills, competencies, values and attitudes are very heterogeneous and are based mostly on leisure activities, not on scholastic practice. The teachers now joining the profession, born since the advent of the Internet, also need to be trained. The same applies to parents, as they have very spotty capacities for employing technical tools to manage their children's access and use of the Internet (Dreyer 2014; EU Kids Online 2014). Both groups experience digital literacies "in the wild" (Frau-Meigs 2012c).

Policy makers should abandon the catchy phrase they have adopted to justify a "wait-and-see" approach, and not leave children to deal alone with mobile applications and Internet services provided by the industry. The earlier children are aware of Internet uses and issues, the better. The more included they are, the more they will know how to contribute to and participate in society through the informed use of technology. Internet governance principles and processes need to be adapted to education and the new constituency of children.

In this context, access is no longer just about physical infrastructure (sometimes called threshold access). It is about real or reach access, obtained through training and competencies, that may ultimately lead to access to opportunity, by which people can effect true change for themselves and their community. This last stage could be considered as sustainable access, with a full, networked presence and online participation leading to the production of meaningful content. Ensuring all these stages of access requires public intervention and a pedagogy for participation that cannot be delegated to the market alone. The proliferation of actors requires exchanges between decision makers and all the members of a community to engage in the protection and promotion of the best interests of children. The scenario of sustainable access is neither natural nor neutral, but is political, as it is driven by globalization and its ICT-driven media and networks. This places the governance of education at the crux of present and future change.

Schools and the Mainstreaming Gap

While certain Internet governance processes and actors (for example, the IGF and the Internet Corporation for Assigned Names and Numbers) are well embarked in the digital transition of accountability and transparency to the multi-stakeholder community, many international and national organizations and institutions, in particular in the field of education, are lagging behind. They are still

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7   The authors' approach is based on research in childhood studies related to social cognition. Communication for development (C4D) is added, with a specific focus on policy and social innovation. For well-being and childhood studies, see Ben-Arieh et al. (2013). For "functionings" and C4D, see Sen (1985); see also Nussbaum (2011) and McAnany (2012, 205–18).

dealing with the Internet as a tool in itself (education 2.0), not as an environment in itself (education 3.0).[8] The effort that is currently being made to find synergies between the WSIS review and the SDGs (and it should be noted that among the 17 goals, only one is directly related to ICTs) is evidence that the underpinning role and ecosystem of the Internet is not yet fully understood. There is a failure to recognize it as the major source of all transformations that will take place in the twenty-first century, in spite of the estimations of international education experts.[9] For example, the arrival of the "Internet of Things," connecting operators, non-human agents and big data, is greatly underestimated, in particular as the driving force behind education 3.0 (Frau-Meigs 2015).

When looking at what is being done about MIL in schools, the situation is very heterogeneous. MIL and related topics are generally absent from courses for teaching degrees and "in-career" training. In schools, these subjects are often left to the initiative of self-taught teachers as they are not part of the basic curriculum. As a result, they are blended with mother tongue and language courses, which makes it difficult to evaluate them per se.[10] The decision-making bodies for education do not completely understand them, which results in inaction, ineffective decision making, an underestimation of needs and costs, and an absence of critical rights (to access, data privacy and ethics).

Digital education is not equitably distributed within and among all countries, leading to a lack of social justice as the digitally excluded are also at risk of economic and social exclusion. If school systems fail to change their curricula, degrees and skill requirements, they risk becoming irrelevant and digital education will take place in spaces that are not open, public and fair (Gauthier 2015, 103–110). In terms of sustainable development and well-being, the cost of inaction is considerable. Decision makers, policy makers and teachers alike need to retool the pre-digital basic curricula to transition more fully to the digital culture, with its attendant constraints and opportunities.

Managing the digital transition implies revising all dimensions of schooling — from kindergarten to university, from student training to teacher training, from learning skills to learning methods and styles, and from the evaluation of teachers to the evaluation of children. The very content of school subjects must be revisited as

well as the competencies, attitudes, values and finalities of the system. Many educational systems are being put to the test and heavily criticized for not being inclusive and for increasing differences in gender, age and access.[11]

On the one hand, there is a persistent negative discourse regarding the digital evolution in many countries and communities. Teachers and parents still often perceive the Internet as being in competition with school and home. Web 2.0 applications are perceived as dividing attention (for example, leisure time and games at school and at home), providing alternative tools to scientific sources of knowledge (for example, online courses and participatory Wikimedias) and increasing risks (for example, harassment, loss of basic literacies, and so on), perhaps even leading to the infringement of human rights (for example, privacy and intellectual property). Many tools available online (serious games, interactive platforms for e-learning, corporate tutorials, so on) are perceived as potentially diminishing the roles of teachers and impinging on the perimeter of schools and universities. Even when these tools are promoted because of their potential to motivate and re-engage students, they are perceived as removing the monopoly of education from the public sphere and as blurring the borders between scholastic learning and gaming.

On the other hand, there is also a very positive discourse about the Internet as a tool and driver of innovative pedagogies, for project-based learning and for the improvement of capabilities such as self-actualization, self-esteem, empowerment, online presence and so on. Research has revealed that, in the communities of practice, there is a lot of energy and creativity at work, for example, the "hole in the wall" computers in India with "minimally invasive education"; école 42, a French school set up on the "Born2code" notion; or the Institute of Play in New York.[12]

However, this positive discourse does not provide an incremental notion of change, it does not give any indication of scalability and sustainability and it fails to posit change management as a key training sector to enable teachers and students alike to move toward education 3.0 with education 3.0 tools. Many educators fear further gaps and divides between the information-rich and the information-poor. They feel that they are expected to manage contradictory goals (foster innovation and yet transmit heritage). In some countries, there is a call for "back to basics" (the 3Rs) and MIL is pitched against

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8   The plans for digital equipment in schools since the 1980s and their evaluations and results demonstrate this, as exemplified in the French plan Informatique Pour Tous (1985), the Regroupement économique et social du Sud-Ouest 2007 plan and in Fichez (2000, 65–72); see also Frau-Meigs and Torrent, eds. (2009, introduction).

9   See World Innovation Summit for Education (WISE) survey "School in 2030," completed by 645 experts and conducted on June 3–30, 2014 (www.wise-qatar.org/future-school-2030).

10 See the 2014 French National Research Agency TRANSLIT project reports in 28 European countries (www.translit.fr).

11 As exemplified by the many controversies concerning PISA [Programme for International Student Assessment] study results. In France, some recent work shows the weight of pre-digital era diplomas and the inequalities being generated by schools that no longer ensure the full provision of social and economic benefits; see Dubet, Duru-Bellat and Vérétout (2010), see also CNNum (2014).

12 See www.hole-in-the-wall.com/, www.42.fr and www.instituteofplay.org.

basic needs rather than being positioned as necessary for capacity building and the production of relevant local educational content.

Such contradictory discourses and experimentations prove that giving teachers and students computers is not enough: tools without skills do not lead to full capabilities.[13] Teachers have to become change agents, not subjects to change. Those who are increasingly convinced of the need to use ICTs lack support (European Schoolnet 2013; 2014). They have to be trained with regards to both MIL and change management within their own institutions, so that they can make their pedagogy, teaching styles and content relevant — as well as attractive — to young people. A process of bottom-up governance — where good practices can be exchanged, transferred and translated, and where tool kits and other resources for training are affordable — can lead to incremental degrees of change, adapted to the rhythm of education and compatible with their students and their communities.[14]

This process can be operationalized with the Internet governance principles and processes in education, in particular with MIL, as already exemplified in initiatives such as the Global Alliance for Partnerships on Media and Information Literacy and its regional chapters, which provides a response to arguments concerning whether MIL and e-skills could deprive schools in poor areas or countries of even basic educational infrastructure and divert attention from the lack of quality content provided by them. For scaling up digital literacy in line with open knowledge and the commons, e-learning strategies for lifelong learning and training (open educational resources, MOOCs, and so on) are likely forces to consider.[15] They are not adapted to all situations, though, and need to be blended with brick-and-mortar schools, as face-to-face interaction remains crucial for education.

Information Cultures Meet Computational Thinking via MIL

Since the 1980s, many "computers-in-schools" plans have performed poorly worldwide, for various reasons, most with a strong technological component: lack of integration of ICTs in the brick-and-mortar education system; insufficient teacher training conditions; confusion

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13 See Strauss (2014).

14 See www.clemi.fr (in French) for the role of CLEMI (Centre de Liaison de l'Enseignement et des Médias d'Information) in the education community in France. With Sorbonne Nouvelle University, CLEMI participated in a MOOC (called DIY EMI; with DIY referring to "Do It Yourself" and EMI referring to MIL in French — Education aux médias et à l'information) for training teachers to build their own MIL projects, with support of ECO, a project funded by the European Commission Competitiveness and Innovation Framework. See https://hub5.ecolearning.eu/course/diy-do-it-yourself/ (in French and in English).

15 See www.oercommons.org.

Examples of Ongoing Laptop-driven School Initiatives

- One Laptop per Child (2007): Early MIT Media Lab-driven initiative for affordable educational laptops (US$100) for children in the United States, Southeast Asia, Latin America and Africa. Mixed results (in India, Nigeria and Thailand, for example) due to a lack of teacher training, in situ maintenance and local content.

- Uruguay and Plan Ceibal (2009): Uruguay was the first country in the world to give each child in primary school a free laptop computer; local content and teacher training were added.

- India and Datawind (2013): The Aakash tablet, the cheapest computer in the world, was sold by Datawind to the Indian government for school systems (with an app store to monetize content).

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between learning finalities (transmission of knowledge) and technical finalities (professional training); industrial economic lobbying vs. educational public values; lack of clearly identified curriculum for new literacies (except for informatics as a discipline); and lack of relevant local content (Moeglin 2005).

In order to reboot computing in a manner that is meaningful for young people and adults alike, it needs to be related to a strong societal and cultural drive, which is not to be separated from local needs and functionings. Traditionally, computing has been associated with three major domains: algorithms and data processing; human-machine interaction; and networked participation with human and non-human agents (Chapron and Delamotte 2010). The arrival of a fourth domain — as a result of social networks, big data and the Internet of Things — led designer John Maeda (2004) to qualify this form of computing as "a new material for expression," that is, as a medium rather than a tool. This vision drives education 3.0 and makes it possible to place computing within twenty-first-century literacies, not just as a set of e-skills, but as part of an enabling environment where "computational thinking" (Wing 2006) meets "information cultures" (Serres 2012).[16]

This thinking is supported by a paradigm shift resulting from the multi-layered transformation of the notion of information that refers to news (media and communication), to documents (library and information sciences) and to data (code and informatics). This change

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16 The STEM (Science, Technology, Engineering and Math) alliance proposed by the New York Academy of Sciences addresses the computing issue by focusing on operational actions, which are mainly geared at using code for applications, captors and robots. See www.nyas.org/WhatWeDo/ScienceEd/GlobalSTEM.aspx.

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is based on MIL as a "transliteracy," which is fostered by the convergence of computation (computer literacy), communication (media literacy) and info-documentation (information literacy). The competencies required for MIL are operational (code, compute, process), editorial (curate, evaluate, publish) and organizational (search, navigate) (Frau-Meigs 2012c).

Such MIL competencies come with a repertoire of online strategies, such as searching, curating, remixing, pooling, networking and gaming (Jenkins, Purushotma and Weigel 2009). They integrate computing and big data with media. They rely on critical thinking and creative skills to move toward transformative literacies based on competences, values and ethics. They go beyond current policies for IT or e-skills that put little stress on the shared values that make sense for children and educators alike (Frau-Meigs 2013a; van Deursen and van Dijk 2010).

These competencies rely on two major principles of Internet governance, openness and interoperability, to make it possible for young people to gain mastery over codes, content and data online. To facilitate such mastery, media platforms and social networks need to be interoperable and, as a result, (re-)mixable and ubiquitous. This mastery fosters reflexivity (looking back at diverse data), collaboration (mixing and remixing data with other people) and creativity (from learning by imitating to learning by doing and simulating). Consequently, children

can move beyond the confines of the controlled spaces of tablets, apps and Internet services that shape their leisure experience and explore other activities, platforms and devices.

However, these Internet governance principles, if weakened or undermined, may affect the development of MIL and of education 3.0 at large. For instance, openness is being threatened by the current intellectual property system (which does not allow much space for exceptions in the context of education and research, in particular in the area of media content and software code) and by policies against network neutrality. Interoperability is affected by the economic battle that companies fight so their proprietary standards can be adopted in spaces such as the Internet Engineering Task Force. In general, there is a lack of legal certainty surrounding the use of the Internet. As a result, children and their parents do not always know how to behave in a lawfully responsible manner online (which may lead to unintentional criminal behaviour by young people); teachers and educators feel the same and are concerned about the validity of their online uses for the classroom (which may lead to a chilling effect and disuse or under-use).

Recommendation 1: Make MIL twenty-first-century basics of the school curricula.

The Governance of Data for Education 3.0

MIL and other basic digital skills need to be put in the framework of innovative pedagogies supported by digital tools, structured around concepts such as constructivism that posit that the learner is a constructor of information. The recent arrival of MOOCs, with their attendant learning models, tends to recombine socialization and personalized learning styles (Frau-Meigs 2015). Like other online forms of teaching — albeit on an unprecedented scale — MOOCs build on learning analytics, defined as "the measurement, collection, analysis and reporting of data about learners and their contexts, for purposes of understanding and optimising learning and the environments in which it occurs" (Siemens 2011). A number of global companies in the ICT-driven learning business, also called "edtech," are pushing for their generalization, and they are gradually becoming more prevalent in schools and universities.

Learning analytics are double-edged for young people as learners: they can have a positive impact in the classroom as they can indicate to teachers where learners have difficulties and help them prepare appropriate and age-sensitive materials for them. As such, they can help bolster well-being by providing attention and fostering motivation in learning. But they can also present risks, as currently nothing prevents corporations from using them commercially in combination with external data on income, health, location, and so on. The governance of data for education should include thinking about who is going

to manage and own the data, and for what uses, within and beyond education. Children's early awareness and understanding of these uses can ensure that they remain in control of such data in their lifelong evolution and manage them as "self data," in relation to their right to consent to any terms of service proposed to them.[17]

So as to ensure that this innovative tool does not bring about a great disservice to open education, institutions as well as individuals need to focus on the data generated by learning analytics and their commercial and non-commercial uses. Currently, there is no regulation of big data for education, yet their uses should be clearly specified, and in the best interests of the child as risks related to privacy, security and dignity are involved. The issue of protection of such data are important for the healthy development of learning analytics, geared to school and classroom use specifically.[18] The conditions of their availability (open, anonymous, private), members of the public who are authorized to use and consult them (child, family, teaching body, business), their relation to other available data (allowed or not allowed, for sale or not for sale), all need to be specified to preserve the public value of education, also vis-à-vis the public service value of the Internet.[19]

Teachers — and the teaching body in general — are resistant to the entrance of big data and digital learning in schools, as there is no policy for the protection of their work and of the well-being of children. They are concerned about the digital footprint of their students, which could lead to undue surveillance risks (these could apply to the monitoring of their own performance as well). This creates a loss in the potential of big data to become small data or self-data to help them and their students in their everyday work. The principles of transparency, accountability and ethics in Internet governance should be considered as a best practice in order to help the public management of such data. In particular, states and local authorities should pay attention to their use, in particular if it is capable of leading to segregation and competition among schools.

Recommendation 2: Regulate data management for learning.

Education on Internet Governance Processes and Principles and Human Rights

Children, like adults, are Internet users with human rights that apply online as well as off-line.[20] Notwithstanding their right to be protected from harm, they should be able to exercise and enjoy their rights to privacy, opinion and information; assembly and association; education; and participation.[21] These universal human rights are also reinforced through the Convention on the Rights of the Child (CRC), in particular in terms of freedom of expression, the importance of the media and protection against materials detrimental to their well-being, and education and protection from violence.[22] The CRC states that adults and states have three public policy obligations with regard to children: protection (as they are vulnerable); provision (of first- and second-degree necessities such as health and education); and participation (whereby children should be associated to matters that concern them). These rights and obligations fit with the development of their capabilities and well-being and, in the context of Internet governance, should enable them to be heard and contribute to decision making and -shaping on matters affecting them without discrimination on any grounds (Frau-Meigs 2011; Liddicoat and Doria 2012).

Progressive interpretations of these rights by states, international and regional organizations, and national and regional courts, enable human rights to evolve in cyberspace in a seamless manner, regardless of frontiers or media types and formats. For example, access to and freedom to use the Internet can be considered as an increasingly integral part of the right to freedom of expression and access to information online (Association for Progressive Communications 2006). In the aftermath of the revelations of National Security Agency contractor Edward Snowden, anonymity and encryption are seen as enabling free expression (Article 19 2015). Similarly, the removal of online traces of children, as part of "the right to be forgotten," is important for children's right to privacy.

In Internet governance dialogues, children who understand both their human rights and the shared values concerning the governance of the Internet have the potential to become powerful advocates of the Web they want. From an educational perspective, the view of the Internet as a global resource that should be managed in the public interest resonates with children's sensibilities

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17 See the complaint of the Electronic Frontier Foundation about Google (www.eff.org/files/2015/12/01/ftccomplaint-googleforeducation.pdf).

18 The leaking of personal data of students in Brazil, including their medical records, underlines the importance of data protection and of fostering the ethical understanding of MIL and digital literacy skills. See www1.folha.uol.com.br/educacao/2015/03/1604926-fichas-sobre-estudantes-de-colegio-tradicional-de-sp-vazam-na-internet.shtml.

19 See CoE (2007).

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20 See United Nations (2012). The resolution affirmed that the same human rights people have off-line must also be protected online, in particular freedom of expression, which is applicable regardless of frontiers and using the medium of one's choice.

21 Respectively Articles 12, 19, 20, 26 and 27 of the Universal Declaration on Human Rights.

22 Respectively Articles 13, 17 and 19 of the CRC.

about the world and society (Phatak-Shelat 2013, 2059–69; Elea 2015).

MIL and Internet studies need to be taught to young people as early as possible in order to prepare them as players, citizens and workers. In particular, they will need to know about Internet governance processes and principles and how they relate to their human rights, as well as being capable of developing advocacy skills in this domain. To do so, they need to be provided with a pedagogy for participation in education 3.0: contributive engagement is not an easy skill to acquire and needs to be elicited in very early stages of schooling, well before children reach legal decision-making age. In this manner, they will be able to make their feelings and opinions known to Internet governance actors and to monitor those who affect their lives daily (teachers, parents) and those who advocate for them in Internet governance events and forums.

Conflating the principles of Internet governance (universality, openness, neutrality, interoperability and diversity) with educational principles (access, competencies, inclusion and ethics) transforms the Internet and its governance into an educational field in itself. Shared values and human rights will hopefully converge until "code becomes law" (Lessig 1999), that is to say, until code upholds rights. Learning about and participating in the shaping of the Internet is therefore an integral component in the evolution of children's rights online, their well-being in education and their future employment opportunities.

Recommendation 3: Foster the active appropriation by children of their human rights and shared values including Internet governance principles and processes.

MIL and Internet Studies as a Frontier Field for Teaching, Learning and Researching

The parallel tracks of education and Internet governance can be multipliers for each other and are mutually reinforcing in education 3.0. But for this to be effective, there needs to be a continuum between primary, secondary and university education. MIL and Internet studies can provide such a continuum as young people can be exposed to basic uses and principles at an early age and encouraged to continue by participating in communities of practice where researchers, teachers and young people interact. MIL and Internet studies can be connected to digital and scientific humanities, combined with Internet-based "citizen sciences" (also known as "crowd sciences" or "networked sciences"). By learning about co-production and co-design with adults, young people can participate actively and see how education 3.0 brings together many fields and disciplines while contributing to future developments.

MIL — recombined with Internet studies, to empower teachers and students alike — needs to be supported by university research and training in this emerging field. Its perimeter, core concepts and curriculum must be developed in order to build the mechanics and levers that can prepare the next generation of professionals in the field.

MIL is a case of frontier research different from mainstream disciplines. Like other emerging fields, it addresses issues that are in flux and controversial: it embraces several notions and touches upon other existing disciplines; it deals with new questions and proceeds with atypical methodologies; and it conducts research with a high degree of uncertainty as it tries to respond to new problems caused by a fast-changing environment (Kuhn 1962; Larédo 2014). As with much frontier research, it is potentially transformative and can shed new light on phenomena, thereby suggesting new ways of thinking and proceeding, eventually producing a paradigm shift. MIL and Internet studies can transform existing sciences and bring about a better understanding of digital scientific humanities. They should be treated as a carrier for the evolution of these disciplines and fields.

MIL and Internet studies as a frontier field can create visibility and lend legitimacy to the area they cover *and* be mainstreamed into other disciplines, in a cross-cutting manner. There is already a more or less formal network of Internet and society centres that could help solidify this frontier field.[23] Other networks, such as the Global Internet Governance Academic Network (GigaNet), already provide analysis on Internet governance worldwide and could serve as a catalyst for research.[24]

The academia and research constituency is well-represented in Internet governance, but mostly consists of legal specialists and political science analysts. Education and youth are considered a "soft issue" that is secondary to the primary goals and principles of Internet governance. There should be a platform of researchers as key independent partners in local, regional and international Internet governance bodies and events to carry out research on all aspects connected with education 3.0.

Recommendation 4: Support Internet studies and MIL as a frontier field in research and education.

ENLARGING MULTI-STAKEHOLDER GOVERNANCE IN EDUCATION

Education needs to embrace the multi-stakeholder process of Internet governance so that children have a recognized place in the networked society, not only in schools but also in other spaces where they gather and learn. Traditional actors and institutions related to education outside schools such as universities, libraries or

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23 See http://networkofcenters.net/research/internet-governance.

24 See GigaNet's four major objectives (www.giga-net.org).

publishers have each evolved in their separate missions and need to reconnect and find new ways to interact with each other around children and young people. They also need to accommodate new entrants in the field to share the processes of participation and the inclusion of young people in education, and to point to new solutions for citizenship, capacity building and employability.

Re-aligning Existing Actors in Education Networks

The larger circle of educational providers (libraries, publishers, universities, and so on) are affected by the Internet's ever-dominating presence and rapid pace of development. New digital actors are emerging in and out of school spaces, such as media community centres and open facilities including "fablabs," and "makerspaces," equipped with operative technology (lasers, captors, 3D printers), where learning-by-doing is promoted and where young people meet adults with innovative pedagogies.[25] These different porous spaces stimulate MIL and the meshing of computational thinking with information cultures as they provide technology and education to a multi-generational public. Notwithstanding adult guidance and supervision, children can also be part of co-education and the co-construction of knowledge.

Libraries are a major stakeholder at the local and national rungs of Internet governance in education and can incorporate fablabs in their buildings. They play an important part in the transition to information cultures and literacies, in particular in developing countries or countries where digital inequalities are considerable, such as India (Jaeger et al. 2012). They can facilitate reading and writing for poor children who do not have access to Internet infrastructure, who cannot pay prohibitive prices for commercial tablets, who lack basic digital literacy or who need to be assisted by technologies because of a disability.[26] Initiatives such as Libraries Without Borders, which translates in French all the online courses of the Khan Academy, show the power of libraries in Internet governance for learners.[27] The International Federation of Library Associations and Institutions advances

this potential for libraries in the Lyon Declaration on Information and Development.[28]

The publishing sector is changing its business models because of, *inter alia*, new entrants in education, such as Google, Apple, Facebook, Amazon and Microsoft. Yet the traditional publishing sector is necessary in order to assure academic quality, criteria for local content and scientific production, and certification (CNNum 2014). Publishers provide manuals and resources that reassure teachers and professionals as to the relevance of the materials they use for teaching. Publishers and editors can be seen as levers for MIL as transliteracy and for mainstreaming good practices. To this end, they must revise their strategies for editing and publishing in the digital era. Educational content online requires clear norms and standards, including those related to creative commons. An exception to intellectual property rights also needs to be negotiated for education 3.0, as part of Internet governance principles (openness, diversity).

To foster Internet governance in education, the role of publishing start-ups and intermediaries is important for local development and sustainability. In Brazil, for instance, repositories of online material (books, papers and pdfs) function as "shadow libraries" that allow students access to content they would not be able to obtain otherwise via commercial platforms such as Dropbox and Whatsapp.[29] Start-ups can use MIL and digital strategies to enhance public and open source content, with the help of digital tools such as software for course design, 3D printing for local dissemination, and so on. Young people and teachers can contribute to manuals and tool kits, through their online comments, in a process of co-design, defined as collaborative problem solving. This points to new directions for the public service value of private sector services and for private-public partnerships.

Universities are also essential for the training of future teachers, and young people should be encouraged to participate in events and activities at an early age, well before they register for a specific degree. They can incorporate fablabs and makerspaces in order to engage more with their local environment. In such porous spaces, the digital and scientific humanities, combined with Internet-based citizen sciences, can enable young people to get involved in the collection and interpretation of data, including data that are of interest to them. When young people are able to do so, such as, for example, exploring the data of their local authorities, they often investigate

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25 Examples in France are numerous: le cube (www.lecube.com), le bal (www.le-bal.fr), la casemate (www.lacasemate.fr); see also the whole worldwide network of fablabs initiated by MIT in Singapore, Japan, Argentina, and so on.

26 See Robobraille, a web-based service that converts documents into a range of accessible formats including Braille, mp3 and Daisy; see Biblus, the digital library companion of RoboBraille, which is a collaborative platform among all special schools for the visually impaired (www.robobraille.org).

27 See www.librarieswithoutborders.org/index.php/what-we-do/our-programs/abroad/transversal-programs/item/280-the-khan-academy-in-france-and-the-francophone-world.

28 See www.lyondeclaration.org.

29 See Brazilian-led project "Shadow Libraries: the ecology of access to educational materials in developing world" (http://direitorio.fgv.br/projetos/shadow-libraries-the-ecology-of-access-to-educational-materials-in-developing-world).

how they can improve their environment.[30] Open archives, e-government data and social networks that are set up for monitoring and training can have an impact on publishing, editing and research that incorporates emerging citizens. Young people, as a community of practice, can be incorporated into the networks and fablabs that are currently participating in a variety of local development initiatives (incorporating families, teachers, non-governmental organizations [NGOs], and so on). They may also promote their own interests beyond mere demand of the masses and market force demand-supply strategies as exemplified by associations such as les Savanturiers, where children follow the adventures of space exploration probes or look at environmental issues such as pollution to come up with alternative solutions.[31] They can move knowledge management away from the corporate sphere of organizational efficiency to their own process of sharing and of using information cultures for learning and researching by doing.[32]

Global multi-stakeholder education initiatives already exist. WISE addresses the "widening gap between the education systems currently in place and those required to meet the needs of future generations."[33] The UN Alliance of Civilizations (UNAOC) has a program for MIL as well as a program for Young Entrepreneurs for Social Change that addresses issues of conflict prevention and collaboration across borders.[34] Yet these initiatives tend to be absent from Internet governance forums and they do not address directly Internet governance issues within their own mandates.

Recommendation 5: Bring together multi-stakeholder governance actors, including children and young people, around the co-design of education 3.0.

Employment and Employability

Young people are among the most vulnerable groups in terms of unemployment. Their situation varies around the world but they are often exposed to cycles of poverty and cutbacks in public welfare, not to mention warfare and displacement. In Europe, recent reports point to a "lost" generation with attendant risks for cohesion, solidarity

and political stability as evinced by the emergence of youth movements that have spread worldwide, such as Occupy or Indignados. This situation has consequences on families and puts stress on children, with increased risks of violence, neglect and illiteracy (United Nations Children's Fund [UNICEF] 2014; Child Helpline International 2013). It lays the emphasis on reducing "illectronism" (illiteracy in MIL and e-skills) and rebooting schools for employability (Frau-Meigs 2011). "Employability" is not about employment *strico sensu*, it is about creating the conditions for jobs, about fostering the functionings and capabilities that can lead a young person to be engaged in the workplace and make empowering life choices.

Mismatch: The Lack of Transition from School to Work

Many developed and developing countries are experiencing high numbers of school dropouts — young adults (aged 15–25) who have no job and little education or training, often without a school diploma, not to mention a university degree (Organisation for Economic Co-operation and Development [OECD] 2011). France, for example, has a 12 percent dropout rate before the end of compulsory education. These young people are estimated to each cost tax payers about €300,000 (Delahaye 2014). In Africa, dropout rates start in primary education, with household wealth and location (rural) impairing opportunities: they are highest in Chad (72 percent), Uganda (68 percent) and Angola (68 percent).[35]

At the same time, many new jobs that rely on MIL and e-skills are not filled. The data vary worldwide, but consistently show that one in five ICT positions are currently unfilled due to a lack of suitable workers. These jobs could reach as many as seven million worldwide by 2015 (International Data Corporation 2012). At the same time, greater numbers of low-qualification jobs are being occupied by young people who are over-qualified. This situation has been identified as a skills "mismatch" — the result of a poor transition from school to work (Global Agenda Council on Employment 2014, 11–15).

This mismatch is, in part, due to the fact that schools and universities still tend to associate computing and digital literacy to high levels of skills. Those advising children, and their parents, in schools and local job centres should be better trained at pointing to these opportunities for low levels of skills that, nonetheless, require some modicum of digital literacy, as even industrial mechanical jobs require basic e-skills. A lack of relevant certification and of appropriate training is also a key factor.

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30 See DATAVIZ projects by Frequence-écoles that train young people in data gathering and data visualization (www.frequence-ecoles.org/tag/dataviz/).

31 See les-savanturiers.cri-paris.org/.

32 Knowledge management could be part of MIL and Internet studies as frontier field. It is itself a frontier field, established since the 1990s as a discipline that includes information systems and information sciences and, increasingly, media and communication, health administration and public policy.

33 See www.wise-qatar.org.

34 See www.unaoc.org.

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35 See www.unesco.org/new/en/dakar/about-this-office/single-view/news/42_of_african_school_children_will_drop_out_before_the_end_of_primary_education/; see also www.uis.unesco.org/Education/Pages/global-education-digest.aspx.

In the absence of adequate MIL and e-skills, the ICT industry finds its own solutions to fill these new positions, such as creating its own training centres, "second chance" schools, youth incubators and co-op arrangements with universities, whereby learners spend half their time on the job. A rising phenomenon everywhere, including in the Global South (in particular India and Africa), these start-ups include many young people in their ranks, with or without university degrees or diplomas. Start-ups combine work-based learning with theoretical learning in schools and facilitate access to hands-on work experience for young people, improving their views on the workplace and their job prospects.

In all industrial sectors, matching skills and jobs has become a priority. Young people can be affected by high rates of unemployment among their ranks, and there is a growing consensus that opportunities to learn on the job and to receive continuing training are necessary. The combined "learn as you earn" philosophy seems to be modifying the relationship between schools and universities.

In addition to upgrading jobs in the traditional industrial sectors, the Internet produces its own creative industries that are participatory by nature and call upon crowd-sourcing and crowd-funding. An array of careers available without a proper university degree certifying them as jobs are emerging: YouTuber, modder, game player, web designer, front-end developer, community manager, content strategist, fablab manager, trainer in mobile uses, and so on.[36] The online global youth culture tends to celebrate those young people among them who started well before the legal working age in many countries, often while still at school or in the process of dropping out of education, who made their success story in YouTubing or game playing.

However, among these emerging jobs, gamers and modders are in a situation of precarious labour, also called "playbour,"[37] which is part of the commodification of youth cultures worldwide. It tends to exploit young people (typically 18–25, sometimes younger) who play as labour, "gold farming" in online gaming factories (Barboza 2005). Some experts suggest that play will be to the twenty-first century what work was in the twentieth century: the definer of roles, status, lifestyle, learning, money making and value production (Kane 2010). The private sector is already tempted to use play as a kind of work ethic, with corporate efficiency about skills and consumption via the immersive experience of gaming. The regulation of commercial playbour and employment safeguards are

necessary to protect children's activities online, promote well-being and encourage creative industries and start-ups.

The Creative Industries for Training and Learning

Among the Internet-based creative industries, there is the strong emergence of new businesses for training and learning, with a growing stake in education 3.0. In addition to the traditional businesses already engaged in e-learning (such as Microsoft and Pearson), there are new entrants leaning heavily on data analytics for edtech (such as Coursera and Cloudera). They are targeting universities and they are making inroads into primary and secondary school education (Innovative Technologies for Engaging Classrooms 2013).

The digital economy has a stake in education 3.0, not just to recruit the future workforce. The private sector is rapidly embracing this vast field, using international digital networks to advance its positions. Besides the United States and South Korea, some emerging countries, as well as the United Arab Emirates, are most active in developing these new businesses that recombine funding, technology and networked teacher training. They are aiming at globalization as a means of maximizing their profits and draining public funding in all regions (as the budgets for education in all countries amount to staggering figures in the range of billions of US dollars).[38] As states' budgets become more challenging to control and are in crisis over public spending, these companies propose their own learning solutions, which also implies privatizing part of public education and benefiting from public funding for their private strategies.[39]

These strategies involve engaging the young audience — a potential major consumer group of online goods — as early as possible. There is an additional lure for young people that has to do with the Internet industry's online discourse, which increasingly reconfigures education as learning by doing and by playing outside brick-and-mortar schools. It offers child-friendly do-it-yourself tutorials, dynamic online courses, YouTube scenarios, and so on. It is already capturing a lot of informal learning for children, which relies increasingly on peer-to-peer solutions (van Deursen and van Dijk 2010).

This discourse is casting a positive light on education as innovation and creativity, the allure of which is difficult to resist. Some select youth social entrepreneurs become

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36 See job descriptions and specifications available at www.netpublic.fr/dispositif-emplois-davenir-en-epn/ (in French). A modder is a player who is encouraged to make "modifications" to games.

37 Expression first coined by Julian Kücklich (2005), and negatively defined as "exploitable (info-)labour that feels like play."

38 See World Bank statistics (http://data.worldbank.org/data-catalog/world-development-indicators).

39 See United Nations Educational, Scientific and Cultural Organization (UNESCO) statistics on education for ranking of countries in terms of their GDP spending (http://www.uis.unesco.org/Library/Documents/ged07-fr.pdf).

corporate entrepreneurs, but this is not the reality for most young people. In fact, the corporations of the digital world are still seeking most of their troops and managers from the elite schools, preferably in engineering. Internet governance in education needs to think about the children left behind. In many developing countries, families bear the cost of education, adding to the digital and economic divide. The privatization of education without proper governance can create significant problems in both the north and south. The Internet governance principle of diversity must be called upon, for the sake of social justice and sustainability. It can put forward public-private partnership strategies for training teachers, including distance learning. It can promote transfer, by translations, the re-design of resources, and the localization of content that can benefit developing and developed countries alike.

Recommendation 6: Harness the potential of creative industries for learning and training.

SHARING THE RESPONSIBILITY OF THE INTERNET GOVERNANCE OF EDUCATION: PROTECTION, PROVISION AND PARTICIPATION REVISITED

In the multi-stakeholder process of Internet governance, three major stakeholders have been implicated since the beginning: the public sector and governments; the private sector and business; and the civic sector and civil society (NGOs, foundations, and so on). All three pillars need to be brought around the table to consider how Internet governance can support education 3.0, beyond the scope of educational institutions. Having all stakeholders share the responsibility of supporting its development, including their own participation, creates a continuum between all sectors of society.

Among these stakeholders, the role of the state is key to ensure that all the competing actors contribute to the process in a balanced and fair manner. States should ensure that human rights, MIL and education 3.0 interface with the processes of accountability and transparency. They should also move beyond the strict principle of subsidiarity that contains education, in particular by calling on inter-governmental organizations and forums such as the IGF, UNICEF, UNESCO and the CoE, to increase the public debate on education 3.0 and Internet governance so that the benefits of shared values can be redistributed to all.[40]

The Private Sector and the Unaccompanied "Solo" Kids Online

The issue of creative industries and playbour points to a complex online environment, with the need for increased safety and security concerns to be balanced with new participatory opportunities. Children are mostly alone on the Internet, dealing with commercial services and applications. This situation raises concerns about the profiling of information and the retention of personal data regarding children's activities for commercial purposes.[41]

As ever younger children access the Internet, the corporate sector has a vested interest in lowering the age barriers of Internet consent (from 13 down to eight), and uses the access to education argument for lobbying purposes.[42] The sector is effectively not treating young people online as children but as consumers (and even prescribers to their parents), whose uses attract a lot of attention in marketing research.[43] For this reason, one of the key issues that resonates with parents and young people alike relates to "terms of service," regularly denounced as being too abstract, not child-friendly, and effectively depriving young people of their agency and their property rights. Another key issue, which resonates with teachers more specifically, is the introduction of such commercial services in schools because they are not geared for pedagogical uses, and they can conflict with state regulations that protect children.

Online content and service providers, in particular, have a responsibility to respect the human rights of children on the Internet.[44] This responsibility implies exercising due diligence to protect them from harmful content and behaviours, to respond to their complaints and to educate them with guidance.[45] They should be encouraged to listen to young people and, where necessary, adapt their services (for example, simpler terms of use, information about re-use of content, replying to questions about the safety, security and privacy policies of services). This promotes the critical thinking and confidence of children who are

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40 See the CoE Pestalozzi programme for teacher training in ICTs (www.coe.int/pestalozzi).

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41 See CoE (2008).

42 See www.zdnet.com/article/mark-zuckerberg-facebook-minimum-age-limit-should-be-removed/.

43 Statistics from the French Conseil économique, social et environnemental, the OECD and so on exemplify this focus on use.

44 In line with Resolution 17/4 on human rights and transnational corporations and other business enterprises, adopted by the United Nations in June 2011.

45 See CoE (2012): young people should be afforded guidance "in order to manage their profiles and understand the impact that the publication of information of a private nature could have, in order to prevent harm to themselves and others."

often alone on the Internet (for example, managing their image and reputation online).[46]

A healthy relationship between children and the providers of these services is needed. This dialogue can be initiated and fostered in a setting that is more equal-footed within the context of Internet governance. Defining the providers' ethical responsibilities when children use their services (irrespective of whether they are of the requisite right age or not) is crucial. This implies that companies revamp their corporate social responsibility (CSR), away from pre-digital "do-good" patronage, to ensure that it incorporates provisions for children and education. At the moment, not enough CSR initiatives target education as a main focus.[47]

CSR should be part of the dialogue ensuring that children are educated as online consumers. Terms of service, "consent" by minors, issues of filtering and blocking need to be part of a larger discussion that encompasses the data footprint, privacy, freedom of expression and education. This should empower schools and libraries where children need to have access to quality content and freedom of expression and creation. The self-regulation by the private sector is not enough, as parents often perceive it as biased in favour of corporate interests. The multi-stakeholder approach to co-regulation has been temporarily solved by parental controls, but such technical means places the onus solely on families and are only useful up to a certain age. Besides, they are not protective of the vast majority of children in the world where parenting situations are disturbed by separation, displacement, immigration, war, and so on.

Co-regulation lends itself also to protection by design, which blends in with participation and MIL: children and parents alike can be sensitized regarding their roles as critical participants online in order to control their screen time and to express choice. Children's roles should be fostered as sources of information and data collection to build proper sets of indicators (Ben-Arieh 2005). Protection by design can thus provide guidelines that are age-sensitive and set into internationally agreed upon industry standards.

Recommendation 7: Reboot the CSR of the providers of Internet content and services to support education 3.0.

The Civic Sector and the Constituency of Young People

Civil society groups that have evolved around Internet governance since the WSIS have lost some of their capacity for disruptive innovation in global network negotiations (Belli 2014). This loss of influence is partly due to the limited capacity of civil society to renew itself and to produce Internet governance-savvy members who are trained in such complex consultations. Civil society has a vested interest in fostering youth participation as part of its own capacity to replenish its ranks and contribute to the shaping of the future of the Internet, in particular by fostering the children/youth caucus within the Internet governance ecosystem.

Currently, there is not a sustained presence of children in Internet governance as they are not a stakeholder group. The Dynamic Youth Coalition on Internet Governance was founded in 2009 at the Sharm El Sheik IGF but has been relatively inactive since. Various other existing regional youth forums (in, for example, Asia, Europe and Africa) have not proven to be very effective. The challenge is really how to move from tokenistic children's participation where they are brought to events to speak about a specific issue toward a genuine voice of many children from different backgrounds. Online platforms offer that option, but they exclude those children who do not have access. Children, with the help of adults, need to work on peer-to-peer strategies that are effective online and off-line so that they can be their own spokespersons and drivers of policy. Such achievements cannot be reached without education and coaching, in the same way as adult participants are trained.

Some countries, such as Finland, are experimenting with children's parliaments. The Finnish Children's Parliament is comprised of approximately 380 children aged nine to 13.[48] In India, similar efforts are being made at a smaller scale in diverse locations, such as Shaishav in Bhavnagar.[49] In the United Kingdom, young people voted on a digital "Magna Carta," which has gained the attention of the media and could compel some Internet corporations to modify their behaviour. In the light of such developments, the absence of youth from Internet governance dialogues could challenge the legitimacy of the Internet process itself. Their presence among the constituencies of civil society could modify the traditional patterns of representation and deliberation.

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46 See ibid.: "social networking services play an increasingly important role in the life of children and young people, as part of the development of their own personality and identity, and as part of their participation in debates and social activities."

47 Vivendi's action in Africa with music development and training for young people in Mali (www.vivendi.com/social-responsibility/) is an example of an initiative where education is an element of CSR.

48 See http://ec.europa.eu/justice/news/consulting_public/0009/contributions/unregistered_organisations/139_finnish_childrens_parliament.pdf; see also Kotilainen (2009).

49 Shaishav, which means childhood in Gujarati, is a volunteer organization committed to the rights of children and child labour; see www.Shaishavchildright.org.

To make their participation more equitable, more distributed and more meaningful, a double strategy is advisable: make children a driving force in Internet governance in order to encourage them to make the case for themselves and to participate in co-design and co-decision making; integrate youth in the agenda of like-minded associations that have created trust around their authentic treatment of children (for example, UNICEF, UNESCO, and so on). Accountability mechanisms also have to incorporate youth by means of advocacy for children (teens speak for pre-teens) and by training adults to listen and to be accountable to them.

Recommendation 8: Engage children and young people in Internet governance as a more effective stakeholder group within the ranks of civil society.

The Public Sector and the Role of Public Action and Social Innovation

Within the framework of governance, the state is no longer a kind of monolith, but a network of many rungs and actors with more and more decentralized services, local authorities and public agencies that are empowered by digital networks. The public value of the Internet is a notion that is making its way, and modifying the very notion of public action, in association with social innovation defined as initiatives taken by citizens in their own hands, in areas the state does not consider as priorities (European Commission 2013). Many initiatives show social innovation revolving around principles of Internet governance that are congruent with principles of C4D and interactions between online opportunities and off-line needs. Microcredit, supported online by crowd funding or crowd sourcing, belongs to such initiatives, aiming at sustainability with emphasis on local life and culture (Frau-Meigs 2013c; 2012b, 45–55).

Social innovation policies that encourage social entrepreneurship relate to governance at regional and local levels and are associated with the rise of civil society as an actor and a partner of more traditional public agents (Laville 1994; European Commission 2013; Klievink and Janssen 2014, 240–249). In Africa, Asia and Latin America, social innovation paves the way for the participation of young people as they form a large demographic in these regions.

Initiatives Showing That Internet Governance Principles Are Already Being Applied with and for Children and Create New Forms of Mobilization and Education

- Ushahidi ("testimony" in Swahili), created by Juliana Rotich, is of one of the most used open source apps in Africa. It uses crowdsourced geolocation and mobile phone data to provide web crisis reporting and information. [50]

- Apps4Africa, organized by Mariéme Jamme, CEO of SpotOne Global Solutions, is a yearly competition that mentors and supports young people to shape Africa's tech revolution.[51]

- Youth Ki Awaaz is India's largest online community media platform run by young people for young people to express themselves.[52]

- PLURAL+ is a Youth Video Festival, with international awards in three age categories (9–12, 13–17 and 18–25).[53]

To encourage social innovation, national laws need to create an enabling environment for start-ups and small companies (part of civil society in the WSIS process). In many countries, strict bankruptcy laws, ponderous administration procedures and prohibitive banking loans make it very difficult to start new enterprises, in particular if a previous venture has failed. These risks discourage young people. Many governments still do not recognize social innovation in creative industries. For example, the National Plan for Cultural Development in Brazil speaks of creative industries, but focuses on provisions to traditional sectors, such as music and television, and does not support the video games sector.

Such examples suggest that policy makers at all levels of government, inside and outside education, need updated training for change management and

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50 See www.ushahidi.com/.

51 See www.africagathering.org/team/executive/marieme-jamme/.

52 See www.youthkiawaaz.com/.

53 See wwww.pluralplus.unaoc.org.

knowledge management, with full accountability. The collateral challenge is to develop indicators that hold societies and governments accountable for more than safekeeping of young people. Decision makers should stop postponing children's "well-becoming" into the future (adulthood) and focus on the immediacy of their well-being. Applied to policy making, this suggests closer consideration of the principles of Internet universality as applied to young people, such as access, freedom of expression, local content, quality literacy, privacy and ethics (UNESCO 2015).

Recommendation 9: Invite public authorities to consider and collaborate on education 3.0, in particular to develop indicators and accountability mechanisms for next-generation (age-sensitive) policies and social innovation.

CONCLUSION AND NEXT STEPS

Well-being and capacity building are necessary elements of sustainability and development for the next billion Internet users, many of whom will connect as children. Creating the right environment for them with regards to the Internet requires education and research. It is incumbent on all stakeholders to promote a healthy and positive agenda for children — the contours of which need to be discussed and co-designed with them. This agenda should encourage children to be active citizens of the Internet.[54] It should promote their well-being and the exercise of their rights and freedoms. It should stimulate their creativity and collaboration. It should address citizenship and responsibilities. It should connect schools and job markets. It should engender a vibrant civil society where the Internet is really a bottom-up social space, the governance of which is constructed democratically.

The way forward is threefold: MIL and Internet studies as a frontier field; a multi-stakeholder structure of networked actors in education; and a mobilization in favour of education 3.0 in Internet governance. A road map for the Internet governance of education should define priorities, with critical milestones over the next five to 10 years, in line with the UN post-2015 SDGs, such as:

- Education 3.0 responds to the crucial needs of citizenship, capacity building *and* employability. This requires that a minimum number of national curricula across continents make MIL and Internet studies into a core discipline of the education system in schools (that is, not as a subject that acts as a conduit but as a discipline in itself), coupled with human rights.

- Education 3.0 addresses children's level of autonomy and empowerment. This implies accepting that online agency is higher than it is off-line (that is, starts from a younger age). Part of this response means turning "solo

kids" online into the collective efforts of young people with advocacy skills who can express themselves, assemble and associate, as part of the exercise of their human rights.

- The Internet governance multi-stakeholder community supports the sustainable digital development needs of children and young people. This implies that a minimum number of national, sub-regional, regional and global Internet governance spaces are created and mobilized that engage and recognize the voice of children and young people in the dialogue and design of Internet governance policies.

These milestones should be discussed and coordinated at the international level by the United Nations, in particular by disseminating this paper as well as in organizing dialogue across continents. To this end, the creation of the position of UN Special Rapporteur on education 3.0 for children and young people's sustainable digital development could help to coordinate and promote coherent and dynamic engagement of all stakeholders, one that facilitates a shared vision in and beyond education as put forward in the 10 recommendations of this paper.

Recommendation 10: Create the position of UN Special Rapporteur on education 3.0 for children and young people's sustainable digital development.

Authors' Note

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54 See CoE (2016).

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