Global Perspectives on Children's Digital Opportunities: An Emerging Research and Policy Agenda

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abstract

Diverse international perspectives show that children can benefit greatly from digital opportunities. Despite widespread optimism about the potential of digital technologies, especially for information and education, the research reveals an insufficient evidence base to guide policy and practice across all continents of the world, especially in middle- and low-income countries. Beyond revealing pressing and sizeable gaps in knowledge, this cross-national review also reveals the importance of understanding local values and practices regarding the use of technologies. This leads us to stress that future researchers must take into account local contexts and existing inequalities and must share best practices internationally so that children can navigate the balance between risks and opportunities. This article documents the particular irony that while the world's poorer countries look to research to find ways to increase access and accelerate the fair distribution of digital educational resources, the world's wealthier countries look to research for guidance in managing excessive screen time, heavily commercial content, and technologies that intrude on autonomy and privacy. We conclude by recommending that digital divides should be carefully bridged with contextual sensitivity to avoid exacerbating existing disparities; that the provision of technological resources is complemented by a focus on skills enhancement, for teachers as well as students; that a keen eye is needed to ensure the balance of children's protection and participation rights, with protection now including data abuses as well as safety considerations; and that we forge collaborations among all stakeholders in seeking to enhance children's digital opportunities worldwide.

Children around the world are increasingly benefitting from opportunities afforded by digital media, but the meanings children make and the consequences of this engagement depend on their different contexts. Optimistic promises regarding opportunities to communicate, learn, and participate are made to justify the provision of digital resources and Internet access to children globally. Yet these promises are countered by prominent public and policy concerns over the harms to children associated with society's growing reliance on digitally networked technologies.

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Drs Livingstone, Lemish, and Lim took an overall editorial role in compiling contributions from all authors and then designing and drafting the overall manuscript; Drs Bulger, P. Cabello, Claro, T. Cabello, Khalil, Kumpulainen, U. Nayar, P. Nayar, Park, Tan, Prinsloo, and Wei made substantial contributions to the manuscript, with analysis and sources from their country or region, and reviewed and revised intermediate drafts of the manuscript; and all authors approved the final manuscript as submitted.

This article recognizes that all children have much to gain from the digital age, especially if evidence-based best practices are shared internationally. But it is not yet clear that there is robust evidence to guide policy and practice so that digital opportunities result in unequivocal and sustained benefits for children. Moreover, huge inequalities exist, often precisely exacerbated by the mutually reinforcing effects of social and digital exclusion. Digital opportunities can bring increased risks in their wake.[1] Navigating the balance between these risks and opportunities, so that children enjoy the benefits of the digital age, is impeded by anxieties (often fueled by media panics) that accompany the risk of harm to children, resulting in sometimes disproportionate responses aimed at protecting children that potentially undermine their digital participation.

In seeking to underpin policy and practice with evidence, it must be acknowledged that in many countries, little research has yet been conducted, leaving policy makers to rely on the quickly growing body of knowledge (funded by a mix of governments, educational foundations, industries, and international organizations) generated in relatively wealthy countries (the United States, Europe, and parts of Asia), despite whether this is locally appropriate. It is also limiting that most researchers have concentrated on educational opportunities (this being the most common justification for providing digital resources and Internet access to children) and on reducing sexual risks of harm (pornography, "sexting," pedophile "grooming"), leaving many important dimensions of Internet use relatively unexplored.

Not only do countries and cultures differ substantially around the world, but these cultural, demographic, technological, socioeconomic, geographic, and political differences shape children's lives,[2,3] both off-line and, now, online, necessitating a complex, comparative, and multidimensional research agenda regarding children's digital lives. Consider that in township schools in Gauteng, South Africa, 1 tablet per child is being provided as part of a "conversion to a full digital learning and teaching platform" or a transition to "smart paperless classrooms," despite the lack of acceptable sanitation.[4] This example highlights how an incomplete understanding of the local context can lead to unfortunate mismatches among critical needs, well-intentioned plans, and resource allocations. Or, consider that although most research stems from urban settings, many children globally live in rural areas (55% of the child population in China, for instance) where difficulties of mass migration, poverty, and loss of parents already undermine children's well-being.

In this article, we outline the important complexities and contingencies that must underpin the future agenda. To do this, we first collated regional expertise from among the present authors, and this led us to focus our account on education to showcase what has already been researched in terms of opportunities and to illustrate wider issues of access and risk (notably regarding exclusion, safety, privacy, and commercialization).

CURRENT STATE

In many countries, the discourse on educational opportunity, along with that on "21st-century skills" (or "innovation" or "digital native") is ambiguous.[5,6] Many hope to find ways to enable access to educational resources and processes of student-centered learning that maximize the potential of technologies to provide personalized pathways and affordable, flexible platforms for "anywhere, anytime" learning. But what remains unclear is whether digital technologies can enhance learning and in what ways and to what end they do so. Is the goal to prepare students for a competitive workforce, to connect marginalized youth, to support schools, or to provide progressive alternatives to school? The goals determine the means, and both have implications for evaluating technological interventions.

At present, countries are facing different challenges. In middle- and low-income countries, the challenges of provision (physical connectivity, sustainable funding, curriculum redevelopment, and teacher training) dominate, and ambitious pedagogical practices and goals are yet to be fully deliberated or implemented,[7] let alone evaluated. For example, over the past few decades, Chile has sought to improve access to digital technologies, which has been rewarded by seeing 45% of homes connected to the Internet.[8] Yet few students achieve advanced skill levels,[9] and researchers have shown that digital technologies have perpetuated and even exacerbated inequalities in educational outcomes.[10] In India, progress depends on the business case for digital education, which is only slowly gaining ground as the education market develops software packages around textbook content. Uptake of smart boards and e-textbooks is limited to a few public schools,[11] and educational opportunities for students are both slow to arrive and unequal in take-up. In the few Arab societies where research exists, the Internet is simultaneously heralded as a liberating educational and participatory tool and feared as culturally and/or socially corrupting.[12,13]

By contrast, research on children's media use and the deployment of educational technologies in well-resourced countries is more

extensive and encompassing, although it is not as conclusive as policy makers hope: research reviews show that the empirical support for the educational benefits of technology use has often not been sought or is weaker than expected.[14–16] Moreover, new issues are emerging that require attention. For instance, the United States, among other wealthy countries, is witnessing calls for data-driven instruction in the hope that this can remove bias in student advancement, equalize education, and improve learning outcomes and teacher efficiency. Yet, illustrating our point that opportunities bring risks, skeptics are concerned about excessive testing, student privacy, and the lack of adequate safeguarding of student data.[17,18] Consent poses a related challenge in an information-rich age: Are students given the right to opt out of communications sent to their parents? Research on parental use of monitoring technologies suggests that such updates about children's whereabouts may trigger authoritarian parents to be more controlling,[19] which in turn is unlikely to enhance children's academic performance.

In certain parts of metropolitan, technologically advanced East, South, and Southeast Asia, in-school and after-school virtual learning and online coordination of academic activities are further intensifying the already considerable academic pressures on children in middle-class households, with the potential to adversely affect parent-child relationships.[20] However, more extensive research is required to understand children's engagement with these educational technologies in home settings and how this relates to their family relationships, cognitive and socioemotional development, academic achievement, vocational trajectories, and identity formation. The intensive incorporation of digital technology into children's lives, for uses that go beyond the academic, has also stoked concerns about addiction.[21] More inquiry is also needed on the existence and nature of second-level digital divides that may privilege some children over others and on how these divides may be bridged through empowering parents and other caregivers with the necessary skills. On this point, too, changing family and household structures have seen the emergence of more "nontraditional" families that experience unique challenges for parental guidance.

Arguably, Finland offers a model way forward with its broad agreement on grounding early years' education in the United Nations Convention on the Rights of the Child to further a comprehensive pedagogy and associated collaborative practices of digital technology usage to support every child's development of multiliteracy.[22] But researchers are circumspect about drawing generalized conclusions from successful practices in particular contexts, leaving much more to be learned.

Research on children's digital opportunities is, thus far, unevenly conducted across countries, especially in the global South. Nor does robust evidence yet exist for the contexts and conditions that support these opportunities so that they can be effectively translated into tangible benefits. Discursive and normative uncertainties mean that, for instance, "digital learning" is open to different interpretations, ranging from an instrumental concern with employability and growth to more idealist concerns for social mobility, social justice, and empowerment. In addition, given the huge inequalities in region, income, culture, sex, and so forth, efforts to promote digital opportunities can also become, inadvertently, the means by which inequalities are reproduced or new risks are encountered.

The scarcity of locally produced content in all media platforms (print, audio, broadcast, and digital) geared toward the culturally contextualized needs of children around the world is a major concern for many societies, especially those with smaller language communities or fewer resources to support indigenous cultures or to resist the dominance of global corporations owned by the West. Thus, many opportunities framed as "global" or even "glocal" may represent, at worst, a subtle form of cultural imperialism, promoting mainly capitalist values and lifestyles, erasing local cultures, and facilitating the exploitation of the global South.[23] Much progress has been achieved through well-intended coproductions (such as the collaboration of *Sesame Street* with countries around the world to produce their own versions of the series) as well as interventions on behalf of international development by organizations such as the United National Children's Fund. But there is also considerable innovation at a local level, and those insights and potentially wider contributions are yet to be harnessed.

Although our present breadth of scope is daunting, it is also exciting insofar as it expands the possibilities for innovative strategies and sharing best practices (or, indeed, learning from the mistakes of others). It is ironic that while the world's poorer countries look to research to find ways to increase access and accelerate the fair distribution of digital educational resources, the world's wealthier countries look to research for guidance in managing excessive screen time, heavily commercial content, and technologies that intrude on autonomy and privacy.

FUTURE RESEARCH

We recommend some directions for future research, employing a range

of social science quantitative and qualitative methodologies. Given the international breadth of the questions, we recommend cross-cultural research that will compare and contrast the cultural specificities with more universal trends and concerns. Key questions include the following:

- What do children, their peer groups, and their families around the world actually do with digital media, and how do these media engagements at school, home, or in the community interact with their cognitive, social, and emotional development;
- what are the conditions that support the effective deployment of digital media for learning and other opportunities, and what values and outcomes are thereby advanced;
- what conditions could prevent the digital realm from perpetuating and even broadening existing inequalities in other areas of children's lives; and
- what strategies should be employed to stimulate, sponsor, and facilitate high-quality research on children's use of digital media in the global South?

RECOMMENDATIONS

General

Many stakeholders are gaining expertise in part of the overall puzzle of maximizing children's digital opportunities, so it is important to facilitate their collaboration. These stakeholders include parents, educators, policy makers, media organizations, medical professions, international organizations such as the United Nations Educational, Scientific, and Cultural Organization and the United National Children's Fund, and local nongovernmental organizations.

Clinicians and Providers

It is important not to prioritize children's online protection against risk of harm to the detriment of their participation, or to do the reverse; reaching an appropriate balance should be achieved by considering local contexts and the needs of less-advantaged children and by consulting with children and young people themselves.

Policy Makers

It is important to ensure that providing digital opportunities does not expand the disparity and inequality between the "haves" and the "have nots," and thus, continuing and carefully targeted efforts need to be devoted to closing digital divides based, typically, on social divisions such as rural and/or urban, class, ethnicity, and sex.

Educators

Providing resources (planning, training, finances) to ensure hardware and connectivity for children's digital opportunities is insufficient without seeking to enhance children's (and parents' and teachers') digital skills and literacies and providing stimulating, meaningful, and contextually relevant software and content.

DOI: https://doi.org/10.1542/peds.2016-1758S

Accepted for publication Apr 19, 2017

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PEDIATRICS (ISSN Numbers: Print, 0031-4005; Online, 1098-4275).

FINANCIAL DISCLOSURE: The authors have indicated they have no financial relationships relevant to this article to disclose.

FUNDING: This special supplement, "Children, Adolescents, and Screens: What We Know and What We Need to Learn," was made possible through the financial support of Children and Screens: Institute of Digital Media and Child Development.

POTENTIAL CONFLICT OF INTEREST: The authors have indicated they have no potential conflicts of interest to disclose.

REFERENCES

1. Livingstone S, Haddon L, Görzig A, eds. *Children, Risk and Safety on the Internet: Research and Policy Challenges in Comparative Perspective*. Bristol, UK: Policy Press; 2012
2. OECD Centre for Educational Research and Innovation. Trends shaping education 2013. Available at: www.oecd.org/edu/ceri/trendsshapingeducation2013.htm. Accessed September 10, 2015
3. United Nations Children's Fund. Children, ICT and development: capturing the potential, meeting the challenges. 2013. Available at: https://www.unicef-irc.org/publications/pdf/unicef_royalholloway_ict4dreport_final.pdf. Accessed September 14, 2017
4. Lesufi P. Accessing special quality education for all in Gauteng. 2015. Available at: www.education.gpg.gov.za/Media/Speeches/Documents/

Budget%20Speech.pdf. Accessed August 29, 2015

5. Cuban L, Jandrić P. The dubious promise of educational technologies: historical patterns and future challenges. *E-Learn Digit Media*. 2015;12(3–4):525–539

6. Selwyn N. *Education and Technology: Key Issues and Debates*. London, UK: Bloomsbury; 2011

7. James J. New technology in developing countries: a critique of the one-laptop-per-child program. *Soc Sci Comput Rev*. 2010;28(3):381–390

8. Rivera J, Lima JL, Castillo E. Estudio Quinta Encuesta sobre acceso, usos, usuarios y disposición de pago por Internet en zonas urbanas y rurales de Chile. 2014. Available at: http://www.subtel.gob.cl/attachments/article/5411/Informe_Final_SUBTEL_UdeChile.pdf. Accessed September 14, 2017

9. ENLACES. Informe de resultados SIMCETIC 2 medio 2013. 2014. Available at: http://www.enlaces.cl/wp-content/uploads/informe-resultados-final-16-12-2014.pdf. Accessed September 14, 2017

10. Claro M, Cabello T, San Martín E, Nussbaum M. Comparing marginal effects of Chilean students' economic, social and cultural status on digital versus reading and mathematics performance. *Comput Educ*. 2015;82:1–10

11. Department of School Education and Literacy. National policy on information and communication technology (ICT) in school education. 2012. Available at: http://mhrd.gov.in/ict_policy_docs. Accessed September 4, 2015

12. Northwestern University in Qatar. Media use in the Middle East, 2013: an eight-nation survey by Northwestern University in Qatar. 2013. Available at: http://menamediasurvey.northwestern.edu/. Accessed September 4, 2015

13. Wiseman AW, Anderson E. ICT-integrated education and national innovation systems in the Gulf Cooperation Council (GCC) countries. *Comput Educ*. 2012;59(2):607–618

14. Ito M, Gutiérrez K, Livingstone S, et al. Connected learning: an agenda for research and design. 2013. Available at: http://dmlhub.net/publications/connected-learning-agenda-for-research-and-design/. Accessed September 14, 2017

15. Livingstone S. Critical reflections on the prospects for ICT in education. *Oxf Rev Educ*. 2012;38(1):9–24.

16. OECD. *Students, Computers and Learning: Making the Connection*. Paris, France: OECD Publishing; 2015

17. Alarcon A, Zeide E, Rosenblat A, et al. Data & civil rights: education primer. 2014. Available at: www.datacivilrights.org/pubs/2014-1030/Education.pdf. Accessed September 14, 2017

18. Haduong P, Cortesi S, Plunkett L, Topelson Ritvo D, Gasser U. *Student Privacy: The Next Frontier*. Cambridge, MA: Berkman Center for Internet & Society at Harvard University; 2015.

19. Nakayama M. Parenting style and parental monitoring with information communication technology: a study on Japanese junior high school students and their parents. *Comput Human Behav*. 2011;27(5):1800–1805

20. Lim SS. Through the tablet glass: mobile media, cloud computing and transcendent parenting. *J Child Media*. 2016;10(1):21029

21. Li Y, Zhang X, Lu F, Zhang Q, Wang Y. Internet addiction among elementary and middle school students in China: a nationally representative sample study. *Cyberpsychol Behav Soc Netw*. 2014;17(2):111–116

22. Finnish National Board of Education. National core curriculum for preschool and basic education. Available at: www.oph.fi/ops2016/perusteet. Accessed September 4, 2015

23. Lemish D. *Screening Gender on Children's Television: The Views of Producers Around the World*. Abingdon, UK: Routledge; 2010

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Pediatrics 2017;140;S137
DOI: 10.1542/peds.2016-1758S

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