Instrumentalising the digital: findings from a rapid evidence review of development interventions to support adolescents' engagement with ICTs in low and middle income countries

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ABSTRACT

In development agendas regarding children in low-income communities, both older and emerging media are typically ignored or assumed to have beneficial powers that will redress social and gender inequality. This article builds on a recent rapid evidence review on adolescents' digital media use and development interventions in low- and middle-income countries to examine the contexts of children and adolescents' access to, and uses of, information and communication technology(ICT). Noting that only a handful of studies heed the significance of social class and gender as major axes of inequality for adolescents, the article scrutinises the gap between the rhetoric of ICT-based empowerment and the realities of ICT-based practice. It calls for a radical rethinking of childhood and development in light of the actual experiences, struggles, and contexts.

Dans les programmes de développement qui concernent les enfants vivant dans des communautés à faible revenu, les médias - anciens comme nouveaux - sont généralement ignorés ou considérés comme ayant un pouvoir bénéfique capable de remédier aux inégalités sociales et de genre. Cet article tire parti d'une récente revue rapide de l'utilisation des médias numériques par les adolescents et des interventions de développement dans les pays à revenu faible et intermédiaire pour examiner les contextes de l'accès à/l'utilisation de la technologie de l'information et de la communication (TIC) par les enfants et les adolescents. En relevant que seules quelques études tiennent compte de l'importance de la classe sociale et du genre en tant que vecteurs majeurs d'inégalité pour les adolescents, l'article analyse en détail l'écart entre l'autonomisation basée sur la TIC et les réalités de la pratique basée sur la TIC. Il appelle à repenser radicalement l'enfance et le développement à la lumière des expériences, des luttes et des contextes réels.

Las agendas de desarrollo que contemplan a los niños de comunidades de bajos ingresos habitualmente pasan por alto los medios establecidos o emergentes o, en cambio, suponen que éstos ostentan poderes benéficos que podrán rectificar la desigualdad social o de género. El presente artículo se apoya en una reciente revisión rápida de la evidencia existente en torno al uso de medios digitales por los adolescentes y las intervenciones de desarrollo en países de ingresos bajos y medianos. En este sentido, el artículo se propuso examinar los contextos en que niños y adolescentes tienen acceso a tecnologías de la información y la comunicación (tic), analizando el uso que hacen de las

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mismas. Además de señalar que muy pocos estudios prestan atención a la importancia que revisten la clase social o el género como ejes principales de la desigualdad entre los adolescentes, el artículo analiza la brecha existente entre la retórica en torno al empoderamiento basado en las tic y las realidades de la práctica basada en las tic. Asimismo, hace un llamado a revisar radicalmente la niñez y el desarrollo a la luz de vivencias, luchas y contextos reales.

Introduction

The communication strategies which accompanied modernisation interventions in the field of development from the 1940s onwards were top-down, decontextualised, and technologically determinist. One of the assumptions on which they were premised was that dissemination of information alone can lead to substantial change and, more specifically, that technical innovation can radically transform remote rural communities in developing nations by pulling them towards Western, urbanised modernity, and comparable economic prosperity (Manyozo 2012). When large-scale, expensive development interventions consistently failed to provide these intended results, instead exacerbating economic and social inequalities in their target areas, the premise and foundation of their design and implementation were questioned (Escobar 2011; Friere 1978; Melkote and Steeves 2001). While some critiques of modernisation rationales and practices for using mass media such as television have gained purchase among media and development practitioners, resulting in the emergence of more participatory approaches (Kleine, Hollow, and Poveda 2014), many of the assumptions of the modernisation paradigm persist.

In relation to children and young people, expectations regarding the promise of ICTs are often at their highest, building on the hugely appealing rhetoric of the "digital native" (Banaji 2011; Brown and Czerniewicz 2010). Many policymakers and practitioners hope that the proliferation of ICTs and digital media in developing countries can expand the participatory potential of communication for development (C4D) programming. But others argue that the rhetoric around ICTs has provided a new and alluring guise for technocentric modernisation thinking in development (Mazzarella 2010) and is becoming ever more entrenched as the notion of a "digital imaginary" (Third and Collin 2016) gains purchase. Given this contested context, this article addresses two overarching questions:

(1) What does the available evidence reveal about adolescents' access, use, and everyday contact with media and digital technologies in low- and middle-income countries, including about development programmes' use of digital media to target adolescents?
(2) Does the available evidence also indicate how problematic practices and modernising assumptions of development projects using digital media with adolescents in low- and middle-income countries could be addressed and transformed?

These questions concern the intersections among several domains of knowledge – ICTs and digital media, and adolescence (both domains heavily led by research in the Global North), and C4D and ICT4D programmatic interventions in low- and middle-income countries (LMICs). Each is contested, even with regard to terminology. In this article, we identify the central terms, debates, and findings that have shaped these fields in the past decade, and examine the gaps between what is known about adolescents' everyday media/digital usage in LMIC contexts and the messy realities of development interventions using ICTs with adolescents.

To answer our research questions, we draw on a rapid evidence review of the literature on adolescence, media use, ICTs, and C4D interventions in a range of low- and middle-income countries (see Livingstone et al. in press) undertaken as a part of the Overseas Development Institute's longitudinal research project Gender and Adolescence: Global Evidence (GAGE). We include material from sub-

Saharan Africa, South Asia, and the Middle East and North Africa (MENA), with some insights from Latin America and East/South East Asia. The experience of undertaking this review in itself brought us face to face with intellectual and political tensions between the perspectives of scholars and practitioners familiar, on the one hand, with international development discourses or, on the other hand, with digital media and ICTs or, again, with childhood and adolescence.

Methodology

We searched databases for research published from 2006 to 2016. The original focus was on girls aged 10–14, but this was widened to include girls and boys aged 6–18 when initial searching revealed a paucity of research on young girls and ICTs. For reasons of quality control, priority was given to research published in peer-reviewed journal but, recognising that much of the research in this field derives from NGOs, government reports, and industry sources, we also included non-peer reviewed "grey literature" and unpublished reports.

Our search terms were: (1) internet OR online OR digital OR "mobile phone" OR app OR comput* OR "cell phone" OR ICT OR "social networking" OR platform OR broadband OR connect* AND (2) child* OR young OR youth OR teenage* OR adolescen* OR minor OR kid OR girl OR boy OR student AND (3) "developing countr*" OR "low and middle income countr*" OR "low income countr*" OR "middle income countr*" OR Africa OR Asia OR MENA OR "Middle East and North Africa" OR "Middle East" OR "North Africa". These were tested on pre-identified databases, with the results limited to English and to the period 2006–16. This resulted in a total of 5,181 studies, which was supplemented by consulting international experts (of whom 20 replied), as shown in Table 1. The total of 5,181 studies represents the cumulative total of hits on each database prior to the exclusion of duplicates. Some expert recommendations were also captured in the database searches. The overlap and duplicates between the expert recommendations and database searches were removed. The 5,181 studies were then screened on the basis of titles and abstracts to judge their relevance to the inclusion criteria about children, media, technologies, development and LMICs, which led to a streamlined batch of 481 studies. The majority of the results that were excluded pertained entirely to adults or university students over the age of 18. This can be explained by the different definitions of adolescence in different countries. Despite the filters and the search terms, many results still pertained to countries in the Global North; some of these results were retained where they provided useful insights on the digital media uses of adolescents from marginalised populations in those countries, and could thereby provide an indication of access and uses and practices of digital media of adolescents from underserved communities. The 481 studies were screened down to 188 studies by reviewing the sections on methodology and study design of each full text article in order to check their compatibility with the inclusion criteria.

We included a few studies from high-income countries (HICs) on the grounds that they captured transnational phenomena or relevant conditions for digital media use in LMICs. We read and coded full texts of these 188 studies according to: type of study; type of data; design of evaluative studies; geographical distribution; and income classifications (as applied by DFID UK). We coded each study thematically in terms of a focus on digital access, skills and practices, opportunities, online risks and mediation (by parents, educators, and peers). Finally, we selected the 62 studies employing robust

Table 1. Number of studies identified by database searched.

Database	Number of studies
IBSS	774
ISI Web of Science	826
EBSCO/SocINDEX	263
Scopus	985
PubMed	2,273
Total	**5,181**
Expert recommendations	107
Total	**5,288**

and relevant research designs and evaluated their findings by means of a standardised analytical template that identified the research questions, place/geographical location, method (including sample and age group), claims/findings, study evaluation, and a critical and discursive comment on epistemology, framing of ICTs, and adolescence. We complemented the resulting insights with selected case studies of ICT-related programme interventions targeted at the capability development of children in LMICs.

We note, in reflecting on this process, that it was disappointing to find so little empirical research on children and adolescents' experiences of ICTs in LMICs, given the optimistic hyperbole in many international policy statements regarding their being supposedly at the forefront of adoption and creative appropriation. It was also disappointing to find ourselves documenting – as below – the limitations in conception, design, and quality of the available research far more often than we could celebrate inspiring studies or programmes with insightful implications for future research and good practice. Despite the wealth of sophisticated literature on children in education studies and childhood studies (see Ennew 2003; Katz 2004; Sen 2014), we suspect this situation reflects the relative invisibility of children's experiences for development researchers and policymakers, it being easier to impose adult-centric assumptions than to engage seriously with children themselves. It may also reflect the sense, endemic in the study of ICTs in development, that technology and, indeed, children's uses of it, is changing too fast for in-depth investigation or, especially, longer-term evaluation of interventions. Last, it was often the case that, although a study was included in our review for its relevance to ICTs, for the researchers or practitioners involved, the ICTs were often black-boxed as merely a convenient and up-to-date means of distributing resources, so that the specific relation between children's literacies-in-context and the affordances of the ICTs deployed would go unnoticed.

Unseen children: messy realities beyond the official statistics

Given that children (up to 18 years old) comprise one third of the population in "less developed" countries (UN 2015), it is surprising – but indicative of children's low status – that neither the International Telecommunications Union nor any other source (e.g. UNICEF) is able to document children's internet access in terms of official statistics for more than a handful of countries. Best available estimates suggest that children are also around one third of the world's internet users (Livingstone, Carr, and Byrne 2015), going online roughly in the same proportion as adults (albeit fewer when very young and up to twice as much as adults when adolescent (ITU 2013)). This makes it impossible to break down the category of "children" in terms of gender, age, household income, or any other factor, although for adults (often misleadingly described as "individuals" or "the population") plenty of sources document persistent forms of inequality within as well as between countries (e.g. GSMA 2016a; ITU 2016; World Bank 2016). It is also, of course, difficult to break down the category of ICTs using official statistics – ICTs take different forms, including online, networked, mobile and also more established media (radio, television, film, press, and so on, all of which are increasingly accessible via online platforms); "online" itself includes diverse internet services including information, gaming, social media, streaming, and other services.

But even if the statistics were available, qualitative research reveals the many reasons why bald percentages should be scrutinised, qualified, and contextualised. It charts the manifold ways in which access and use depend on resolving a host of challenges associated with electricity, connectivity, cost, digital skills, social acceptability, spatial privacy, and adult permission at the community and individual levels, as well as with commercial viability, investment, and government regulation at the level of the state or region (Chigona, Kamkwenda, and Manjoo 2008; Hilbert 2010). For many children, access is absent, limited, sporadic, or otherwise problematic, and it varies by age, gender, socio-economic status, caste, and other important sources of inequality (Banaji 2015, 2017; Bosch 2008).

For example, in their sizeable multi-method study of 9- to 18-year-olds' mobile phone use in Ghana, Malawi, and South Africa, Porter et al. (2012) found that mobile phone ownership/usage

varies according to the income level of each country, with Malawi scoring the lowest, followed by Ghana, then South Africa. There is the same pattern across locations in each country, with the remote rural being the lowest. Distinctively, certainly by comparison with children's experiences in much of the Global North:

> "many young people across Africa obtain work and live off resources provided by social contacts: kin and friendship networks are crucial in this respect … This requires careful nurturing of social relationships over time and mobile phone contact is extremely valuable." (Porter et al. 2012, 149)

Porter et al.'s findings caution against the assumption of a linear progression between the spread of ICTs and mobile devices across the globe and access as optimistically assumed in industry and policy reports (e.g. GSMA 2016a, 2016b). They demand recognition of the crucial distinction – ever less meaningful in the Global North – between access and use. In their research, most young people did not own personal phones and so had to ask for or borrow them, most commonly from a family member, with phone ownership sometimes facilitated as a gift from urban-based family members. But such phone ownership can be transient, since young people's phones are also sold to obtain daily essentials when in need. Moreover, borrowing is inflected by family status (e.g. foster status), household resources and livelihood patterns, and intergenerational relationships. For example, restrictions on borrowing are widely reported in Ghana and Malawi (Porter et al. 2012) and also in India (Banaji 2017).

Even when access is feasible, care should be taken in presuming use. In their small-scale comparison of two cases with South African youth – one with low-income older urban teens, and one with younger boys (11–13) from an affluent suburb – Walton and Pallitt (2012) provide a nuanced sense of digital media in everyday life. For the poorer adolescents, it emerged that poverty constrains media use in key ways. One boy listened to his neighbour's music through the wall, and he rationed daily game playing to 15 minutes to save his phone battery (as he pays to charge it). It seems, too, that he only used some phone functions, again, to save money. Another boy used such an old phone that his peers ridiculed him, so he tried to use it in ways that his friends wouldn't notice (e.g. on silent/vibrate) to avoid being shamed. Furthermore, the boys in this study selected their games because they were free or very cheap, and they were ingenious in locating free/cheap downloads and in avoiding commercial tactics to "steal" their prepaid airtime. The older teenage girls, too, had developed strategies to manage their stringent lack of resources – for instance, deleting their games to make phone space for messages from boyfriends (saved to cherish intimate memories). Between the older boys and girls, a local instant messenger app permitted playful and flirtatious interactions, offering a way to show off by competing to collect contacts. Walton and Pallitt observe that "*gaming is a popular local appropriation of mobile phones … Unlike expensive console games, they do not require specialised hardware or negotiations with other household members*" (2012, 353). Significantly, this led them to explore how "game literacy" permits young people to articulate and re-appropriate their lived experiences of gender, class, and ethnicity with energy and creativity (although the consequence is the reproduction of existing inequalities – for example, boys using gaming to reassert the value of masculine subcultures and the exclusion of girls from this).

Good intentions backfire: struggles to deploy ICT to overcome inequality

Particularly problematic, as amply illustrated in our corpus of research studies, are those policy and programmatic interventions which focus on access alone as the "solution" to inequality without due attention to context and consequences, intended and unintended. For example, Hansen et al. (2012) examined whether provision of a laptop for educational purposes enabled the cognitive development of 10- to 15-year-olds in Ethiopia, comparing them after six months of use to children without such provision. Perhaps surprisingly, "*there were no systematic increases in student performance due to laptop use*" (993). But this overall finding was, on more detailed examination, qualified by finding that use of laptops did benefit the performance of students – on measures of abstract

reasoning – in higher grades but not in lower ones, possibly because the older children used the laptops more, and for more activities. In other words, providing access without attention to pre-existing skills and social contexts can result in exacerbating rather than ameliorating inequality.

While this problem is known in ICT4D circles, the troubling case of One Laptop per Child being the most telling instance (James 2010), recent literature remains replete with studies that seemingly discover anew that merely providing access is unlikely to deliver intended goals; quite the contrary. A benign interpretation suggests that this reflects insufficient knowledge-sharing among the different expert fields that inform intervention programmes, the dual myths of potent new technologies and digitally savvy children holding sway for many even when evidence contradicts them. A less benign interpretation points to the political and economic interests behind interventions, focused on the highly visible and newsworthy distribution of expensive and shiny technologies while under-investing in much-needed accompanying programmes for literacy and training and, saliently, failing to consult the views of the supposed beneficiaries, especially when these are "merely" children.

Sometimes it simply seems beyond the scope of a study to examine why a well-intended intervention fails. For instance, consider Pfeiffer et al.'s (2014, 183) puzzlement when providing 15- to 19-year-olds in urban Tanzania with health information. They found that even though the adolescents were media-savvy:

> "almost none of [them] made use of sexual and reproductive health information on the sites targeted at youth. Instead, they went into search engines such as Google, where they entered keywords and screened the websites that came up."

A similar instance is Nwalo and Anasi's (2012, 93) study of adolescent girls' access to, and use of, reproductive health information in Nigeria: they found that "*interpersonal means of communication and mass media were the sources through which the respondents accessed reproductive health information*", notwithstanding the availability of more reliable, in-depth, and confidential information online. While these studies presumed that digitally savvy young people would benefit if resources were simply provided, for Gouws (2014), Banaji (2011), and Brown and Czerniewicz (2010), the digital native discourse has more pernicious consequences in compounding existing inequalities by directing learning resources uncritically towards those who are already at home in digital environments even though they are often already privileged. This is not to argue against the importance and value of support for digital resources and skills, but rather to urge attention to empirical research on how such resources and skills are distributed unequally and, then, to ask critical questions about which should be fostered, with whom, and to further which (or whose) goals.

To counter the problematic emphasis on access alone, Larghi et al. (2015) frame their study of Argentinian teenagers in terms of the digital divide, distinguishing the first-order digital divide (in access to hardware and connectivity as a function of age, gender, and social class), the second-order digital divide (in digital media appropriation within families and the development of digital skills and literacies), and the third-order digital divide (in terms of actual practices of use and, thereby, the benefits that might accrue). In the Global North, attention to the first-order divide is fading as access becomes taken for granted, although the importance of the second and third-order divides remains important. In the Global South, all three are important, demanding distinct but interrelated research on access, social contexts, and consequences of use.

But addressing such challenges demands nuanced and contextualised research. For instance, Lemphane and Prinsloo's (2014, 738) ethnographic comparison of the digital literacy practices of 8- to 14-year-olds living in wealthy (white) and poor (black, "slum") households outside Cape Town, South Africa acknowledged the ways in which these resources have become part of a rhetoric of progress and modernity in order to grasp how and why provision of digital tools entrenched rather than overcame social and economic inequalities:

> "digital media [were] at least partially complicit in a 'widening of the gap' to the extent that the differential uses and availability of resources across social classes produce different imaginings of self, social ambitions and

> investments, and differing ways with social semiotics. Such differences translate into and contribute to the maintenance of social inequalities in school settings that coincide with language and social class divides."

In short, in the context of South Africa, where English is the language of a privileged white elite, merely going online was implicated in reinforcing hierarchies of power:

> "While the [privileged] Bolton children are learning to think of themselves as legitimate participants in local, online, globally connected middle-class English language-based culture, the [poor] Mahlale children are acquiring linguistic resources that are localised, indexical of their sub-elite status and not associated with success in schooling." (Lemphane and Prinsloo 2014, 750)

Lemphane and Prinsloo (2014) are critical of calls for digital out-of-school interventions that use mobile phones or multiplayer games but pay little attention to the way in which limited access and unsympathetic surroundings (lack of food, time, parents with little interest in digital media) can frame and alter poor, non-white children's experiences of pleasure and learning online. As one of the few studies designed to examine these differences in qualitative and comparative ways, Lemphane and Prinsloo's work suggests a template for other future studies in different locales. In other words, if insights from wealthy homes are to be applied in less privileged contexts, considerable criticality and adaptation will be vital.

Countering "adultism": the importance of child-centred, contextualised, and participatory approaches

In *Girls Speak Out*, based on a "fast-talk" process with 33 girls aged 12–18 from 13 countries in Asia, West Africa, and Latin America across a mix of rural and urban locations, de Pauw (2011; see also Raftree and Bachan 2013) found that, on the one hand, the girls faced substantial problems (including teen pregnancy, child labour, health risks, poor sanitation, and sexual violence), but they nonetheless have "*big dreams for their future careers*" and "*see education as the foundation for their success in life*". Asked specifically about ICTs, they were eloquent about both the difficulties of access (adding new insights on, for instance, how domestic chores took up all their time, and how boys edged them away from the computers in school, while cyber-cafés could be a site of sexual harassment) and also the opportunities they hope for. They talked about valuing ICT to research issues they care about, including their rights, community development, physical and mental health information, economic opportunities, news, gaining job skills, or finding work. They wanted to share experiences, discuss problems or use ICTs for activities related to awareness-raising, campaigning, civic engagement, and student mobilisation.

Girls' proposed solutions to increasing their access to ICT are also noteworthy – they highlighted the need to address gender-based inequalities, injustice and stereotypes, both in general and in relation to technology. They thought it would be necessary to educate parents, teachers, and communities on the importance of girls' access to digital media, as well as to make access to ICTs better. Girls were also interested in ICTs being better integrated in the curriculum, having technology content and curricula in their own languages, and in more opportunities for peer-to-peer learning. Yet, in our rapid evidence review, we found few studies exploring these topics or seeking ways to empower girls in the ways they themselves wish for.

A good example of an initiative seeking to empower adolescents to discuss the issues that concern them while informing local governance policies is UNICEF's mobile-based platform U-Report. This text messaging communication platform was launched in Uganda in 2011 (Kleine, Hollow, and Poveda 2014) as a local initiative allowing young people to contribute ideas to governance and decision-making processes that impact on their local communities. Users have an average age of 24 and those who sign up share opinions on topics ranging from job skills to disaster management (UNICEF 2015), and respond to questions sent out by UNICEF staff twice a week. These are then aggregated and shared with media and policymakers. Since its inception, U-Report has spread to several other countries and has reportedly reached a million active users (UNICEF 2015). Although in some

countries the platform is also used by policymakers, crucially for our argument, evidence that young people's voices expressed on the platform have any impact on or response from policymakers is slim in the evaluations, and children are not included either in evaluation or policy-making.

In another case, the Kenya-based non-profit organisation AkiraChix partnered with large development organisations and the corporate sector to address the under-representation of women and girls in ICT-related fields. Its programmes target girls of different ages and backgrounds and include kids' camps, week-long intensive boot camp training sessions for high school girls, and a year-long training in programming, design, and entrepreneurship for young women from under-privileged backgrounds, followed by placements in different tech organisations at the end of the programme. Since 2010, 61 young women trained by AkiraChix have gone on to get internships, jobs, or to start their own businesses (AkiraChix n.d.). The programmes raise the capabilities of these young women, equip them with employability skills, open up opportunities of a possible career in ICTs, and bring them into contact with highly skilled women ICT mentors, all of which are in themselves huge opportunities. However, the intensive effort required to reach this relatively small number of girls over several years makes such an initiative difficult to sustain or implement at scale.

Other challenges and criticisms also exist. One is that the widespread fascination with digital technologies risks that the focus and analysis becomes media-centric, losing sight of the bigger picture of the contexts and meanings of children's lives within which digital media may or may not find their place and contribute constructively (or otherwise). This problem seems particularly evident in the field of health and information seeking, where the convenience and confidentiality of digital media is particularly appealing to practitioners. There is little doubt that adolescents want such information – Global Kids Online found that around a fifth of 12- to 14-year-olds and 43% of 15- to 17-year-olds in South Africa looked for health information online at least every week (Byrne et al. 2016). But initiatives often promote narrow adult-defined forms of information rather than responding to adolescents' interests, or they provide generic access to the internet with little check on the types of information gleaned in terms of accuracy or relevance. No wonder they chart less-than-hoped for success, while their target audience sought the required information from peers, parents, or the more-familiar mass media (Livingstone et al. in press). Relatedly, and keen to benefit from the fact that adolescents' access to digital media is growing significantly in many low- and middle-income contexts, Mitchell et al. recommend not an either/or approach but, rather, that "*education programs delivered face-to-face, such as in school or religious settings could be enhanced with SMS reminders and additional information about program content*" (2011, 778).

An example of a programme designed for flexible delivery is the World Starts with Me (WSWM), a computer-based interactive sex education programme developed in 2002–03 for secondary school students (aged 12–19) in Uganda, and implemented in over 150 schools since (Rijsdijk 2013). It aims to promote sexual and reproductive health by educating young people to make independent decisions about sexual practice. The programme supports the efforts of Ugandan educators to integrate ICTs into the school curriculum. Evaluation of the WSWM programme involved a quasi-experimental design, including pre- and post-test, intervention and comparison groups, and was conducted using a school-based self-administered questionnaire. Outcomes varied based on the way the WSWM programme was implemented at each school, but overall, students from the intervention group who had considerable exposure to the programme (completed at least the first 10 out of 14 lessons) had better outcomes on several indicators, including awareness of pregnancy prevention methods, intention to delay sexual intercourse and to use condoms, and self-efficacy in dealing with sexual violence. Yet, the evaluation also found that the limited number of available working computers, sporadic lack of electricity and insufficient teacher training were major implementation problems faced by most of the schools.

In her ethnographic account of children in Western India, Banaji (2015, 14) urges research, policy, and practice to look "*behind the hi-tech fetish*". Only then, too, can one recognise how children use and value (or not) ICTs in practice – for instance, seeing that "*knowledge and skills in apps, games, scams, jokes and memes constitutes one evident facet of media literacy*" (Banaji 2015, 16). Other

qualitative studies tell a similar story of creative re-appropriations in the face of high-pressure normative expectations from adults regarding children's ICT use. Pathak-Shelat and DeShano (2014, 984) explain how "*Indian families in rural areas and small towns experience a clash of expectations between how digital media technologies* are promoted and how they are experienced" (our emphasis). Thus, while families explicitly associate digital media with work, educational opportunity and information:

> "this perception seems to come from the media and other external sources, rather than directly from personal experiences with new media technologies because when they talked about their own practices, playing games on computers and cell phones was the most frequent response." (989–990)

This is not entirely a matter of children's preferences: "*digital technologies are marketed as youth-oriented technologies giving 'power' to youth (youth agency), but we observed a web of school and parental controls surrounding their use*" (992).

Other studies critique the tendency to underestimate children's capabilities to negotiate and navigate digital environments. For instance, systematic formal educational initiatives to teach younger children about the complex risks and opportunities in digital environments in low-income communities of the Global South are few and far between, and significantly hampered by norms governing the discussion of sexuality, pornography, and other sexual content with children. Further, focusing on young people living in marginalised contexts in South America, Europe, and Australia, Snyder and Prinsloo (2007) argue that subtle cultural disjunctures between school, home, and community often mean that knowledge and experiences about ICTs, health, or sexuality gained in one site do not transfer or are not recognised and valued in another. Yet Cook et al. (2012) challenge the widespread tendency to infantilise children as incapable of understanding the risks involved, their study showing that not only are some children aware of the risks, but they deal with them on a daily basis.

Conclusion

ICTs are often intended and even assumed to act as an enabler or facilitator of equity and participation: but often they do not. Given the paucity of evidence about adolescents' digital media uses between and among regions in LMICs, international development policy informing programmes targeting adolescent capability development need to be critical and cautious in how ICTs are harnessed to promote child rights. While ICT4D interventions have some limited successes (e.g. ITU 2011; Sachs et al. 2015), their engagement with issues pertaining to adolescent capability development and child rights is particularly wanting. Our review suggests a problematic divergence between what adult stakeholders expect children (particularly those from low-income areas) to do with digital media and with what they actually do, as well as between development interventions' assumptions about the potential and the realities of many children's access to, skills with, and interest in ICT-related interventions. Too often, interventions have tended to focus on the supply side while ignoring dynamics that structure demand and use and, therefore, condition practices; they thereby risk perpetuating hierarchies of gender- and age-related power.

In this article we have tried to highlight promising studies of interventions, respecting the good intentions of many of those working to improve children's lives through the use of ICTs. However, few if any cases show evidence of long-lasting social change, even though it is crucial that development interventions are sustained beyond the rudimentary achievement of programme objectives in order to learn the significance of ICTs for adolescents' capability development, especially their potential to contribute towards social justice by expanding the equity, participation, and agency of young people in determining their futures. Most worryingly, some fear that through the fascination with ICTs:

> "the global corporate players (through new gadgets, schemes, and advertisement), as well as the government, through rhetoric and development schemes, are *raising normative expectations* to be part of global markets that are impossible to meet in their rural location with infrastructural limitations." (Pathak-Shelat and DeShano 2014, 998, emphasis added)

In one study, 15- to 19-year-old students in urban Brazil concluded that they had grown up "*under the influence of the Internet and under the logic of cultural consumption associated with it*" (Ferraretto et al. 2011, 393). This logic was barely addressed in the literature reviewed, and yet ICTs are usually proprietary, leaving programme providers dependent on the terms of service of the ICT provider (cost, data security, user privacy, commercial exploitation of data, etc.). Further, ICTs are regulated by state bodies either directly or through corporate franchises, and quite often in a restrictive manner involving censorship, and can be used as tools for surveillance (Chattopadhyay 2011; Gomez 2004). It is therefore important to ask critical questions in the face of growing enthusiasm for the use of ICTs within programmatic interventions in LMICs (Banaji 2015, 2017; Kleine, Hollow, and Poveda 2014).

We have shown how maximising the positive potential of ICTs requires a grounded understanding of how technology interacts with social, political, and economic factors important for development (Banaji 2017; World Bank 2016). While this conclusion is already established in the field of ICT4D, it seems that each generation of researchers, policymakers, and practitioners must rediscover such findings if they – and we – are to sustain a critical lens on the much-hyped and yet reasonably hoped-for prospects for new forms of online learning and information, for the exposure or protection of children from online risks, and in relation to children's rights to participate in community, leisure, civic, and political realms (Livingstone and Bulger 2014). Such efforts must include attention to the lifeworld and its pre-existing inequalities also to find participatory strategies to recognise the particular meanings and practices that shape the lives and concerns of the children who are, after all, the intended beneficiaries. Given the continued innovation and adoption of ICTs and digital media across LMICs, it is no longer possible to conceive of development without ICTs. At the same time, the role of ICTs needs to be critically assessed, rather than assumed, and evaluated alongside the non-digital development opportunities relevant to children and their life contexts.

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