



iPads, Free Data and Young Peoples' Rights: Refractions from a Universal Access Model During the Pandemic

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ABSTRACT *The United Nations deemed internet access to be of critical importance for human rights in 2016. In 2020, schools around the world closed during the COVID-19 pandemic. As schools were closed, inequities in internet access gained widespread public attention as many educational opportunities shifted online. Amidst this shift, this paper analyzes an Ontario provincial announcement to provide 21,000 iPads and free data for young people (ages 4-18), during the pandemic. The closure of schools in Ontario, Canada, meant that young people and families who faced technological challenges, such as a lack of devices, stable and affordable internet connections, or sufficient data allowances, could experience barriers to their right to an education. This paper revisits a community informatics (CI) model of internet access, the Access Rainbow, to analyze attempts to operationalize the right to an education through technology in Ontario. In parallel to rights, however, the field of CI faces the ongoing presence of profit-oriented corporations within universal access efforts. This paper argues that socio-technical infrastructural elements of access to the internet became visible through the breakdown of the pandemic. Furthermore, it considers the multi-stakeholder efforts required to implement useful and effective access, where school boards responded in varied ways locally. The paper contributes the concept of refraction to offer continued theorization of a distributive paradigm and a rights-informed approach in community informatics against the backdrop of the pandemic, which could also act as an opening for privatization and disaster capitalism.*

KEYWORDS digital divide; internet; youth; rights; community informatics

Introduction

Many school-aged children have asked the question, how do you make a rainbow? The probable answer to this question is to take a prism – a triangular piece of glass that bends light – to show the child that they can refract a ray of light to make a rainbow. The term *refraction* was used in the

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ISSN: 1911-4788



title of this paper because the COVID-19 pandemic functions like a prism. School closures make visible the socio-technical bands required for young people (ages 4-18) to leverage the internet to more fully experience their human rights in Ontario, Canada.

The idea of internet access as a human right coincides with the imagery of a rainbow through the Access Rainbow model for universal access, which was developed in the late 1990s by Clement and Shade (1996, 2000). As the Canadian government was connecting its citizens, Clement and Shade (1996; 2000) identified that the internet could support human rights, but that infrastructure development was often left to market forces, with major government sponsored connectivity programs for communities at risk of defunding (Clement et al., 2012; Shade, 2010). Within this milieu, the Access Rainbow model includes socio-technical bands, such as carriage, devices, content, literacy/facilitation and governance, which are required to make universal access to the internet empowering in communities. Clement and Shade's model can be considered alongside infrastructure scholars like Star (1999), who question "computers as information highways" and suggest we turn to examine issues like "justice, and change" (p. 379). Star (1999) also argues that breakdowns can create a moment of visibility for infrastructure; when "the server is down, [or] the bridge washes out" we can see the "relational nature" of infrastructure (p. 382).

The pandemic revealed that the infrastructures for healthcare are interlinked with the education system, and the internet. In Ontario in early 2020, there was a fear amongst policy-makers that ventilators and other critical equipment would run short (Ontario, 2020a). Physical distancing was implemented, and Ontario mandated province-wide school closures for junior kindergarten to grade 12 (K-12) learners to contain the spread of Covid-19 (Ontario, 2020b). Young people were compelled to learn at home and continue their education online (Ontario, 2020g). The digital divide,¹ however, meant that some students lacked devices, internet connections, or sufficient data allowances. To address this inequity, Doug Ford, Premier of Ontario, and Stephen Lecce, Minister of Education, announced that 21,000 Apple iPads and free, longterm evolution (LTE) data plans from the Rogers telecommunications company would assist students to learn at home (Ontario, 2020f).

While the iPads and free data announcement in Ontario *sounded* positive for learners, the plan had some shortcomings. First, not all school boards in Ontario participated in providing new iPads with data plans, and there were no common criteria for student eligibility (Stiles, 2020; WCDSB, 2020). Second, the quantity of the device and data plan provisions announced by the province were sparse. During the pandemic, Ontario had over two million

¹ In this paper, the digital divide refers to unequal access to information and communications technologies (ICTs) as well as inequities in using them. See Eubanks (2007) for a fuller discussion.

learners enrolled (Ontario, 2019a). The 21,000 iPads and data plans could therefore only be deployed to one percent of learners. Reaching one percent of learners was projected to be inadequate because 14.4% of Ontario households are known to have *no* or *slow* (five megabits (Mbps) per second) broadband services available for purchase, and affordability is also a barrier to access (CRTC, 2019).

Some aspects of how Ontario's Progressive Conservative government announced 21,000 iPads and free data plans during the pandemic pointed towards the celebration of private corporate partners, while the role of the public partners, Ontario's school boards, was also noted (Ontario, 2020f). The combination of public and private partners in the announcement opens up the opportunity to explore the nexus of *community informatics* with young peoples' *rights*, while also considering the opportunities for *privatization* and *disaster capitalism*.

Community informatics (CI) is a scholarly approach, which recognizes that as an information society developed from the 1990s onwards, corporations have prioritized "profit maximization," while a potential pathway towards social justice goals remains (Gurstein, 2003). Gurstein (2003) suggests that through CI there can be an "active participation on the part of the local community to 'animate' the process of technology acquisition and implementation" and to orient it towards achieving a community's own objectives or well-being (Eubanks, 2007; Gurstein, 2000, 2003; Stillman & Denison, 2014). The Access Rainbow model reviewed and applied in this paper, is situated within CI (see Clement et al., 2012; Gurstein, 2000), and provides a framework with which to explore the iPads, free data plans, and related access initiatives in Ontario.

Young people's rights are also integral to explore. In this paper young people refer to individuals who typically fall between ages 4 to 18 in the K-12 education system in Ontario (Ontario, 2007; Ontario, n.d.b). While K-12 learners were the target recipients of iPads and free data, this initiative can be understood within the policy trajectories of human rights and universal access both internationally and in Canada. In Ontario, many of the pandemic related efforts to connect students were undertaken by school boards and educators across the province (e.g., see Teotonio & Rushowy, 2020). This paper will analyze the provincial iPads and free data announcement (Ontario, 2020f), but also explore how 12 school boards, including educators and families, grappled with the complexities of universal access for learners during the pandemic. Applying the Access Rainbow in Ontario contributes to continued theorization of the distributive paradigm and a rights-informed approach in CI during the moment of refraction created by the pandemic.

While the pandemic makes visible the socio-technical elements of universal access associated with youth rights, private interests are also revealed. In their announcement of 21,000 iPads and free data, the province emphasized a partnership with Apple and Rogers. Corporate partnerships potentially link to privatization and disaster capitalism during the pandemic.

Disaster capitalism is a term that Klein (2007) used to refer to “raids on the public sphere in the wake of catastrophic events” and also “the treatment of disasters as exciting marketing opportunities” to impose or expand upon capitalist logic (p. 6). One example was the displacement of public schools, with privatized charter schools in New Orleans, following Hurricane Katrina.

Having briefly introduced CI, young people’s rights, privatization and disaster capitalism, this paper continues with five major sections. The first section grapples with how privatization and disaster capitalism serve as a backdrop for the iPads and free data announcement (Ontario, 2020f), as well as providing a policy timeline leading up to it. Second, the question “*is internet access a human right for youth in Ontario?*” will be explored. The distributive paradigm for access will be shared to highlight the challenges to realize human rights. A range of policy ideas from the international, federal and provincial level will also be examined to consider how internet access is positioned in relation to human rights. Third, the Access Rainbow model will be reviewed, before it is applied to the iPads and free data announcement (Ontario, 2020f). The model will be applied using a purposive sample of data from 12 school boards that offered iPads, free data or other connectivity initiatives during the pandemic, between approximately March to June 2020.

Application of the Access Rainbow reveals some distributive aspects of connecting students through data plans, iPads and other devices at the bottom layers of the model. At the middle of the Access Rainbow, how virtual learning environment (VLE) software is already embedded in school boards and was utilized as part of the pandemic response will be examined. Finally, the application of the upper layers of the Access Rainbow, will show how school boards’ and educators’ concerns for well-being and a broad spectrum of youth rights shaped their implementation of universal access during the pandemic. This paper culminates by considering how universal access continues to be enmeshed in a distributive paradigm where the role of big technology (big tech) corporations and disaster capitalism need to be considered. The pandemic may create opportunities for profit in public education, but also more hopefully the expansion of the tech equity agenda and greater recognition of children’s rights within the digital age.

Are Privatization and Disaster Capitalism the Backdrop for the iPads and Free Data Announcement in Ontario?

To better understand the iPads and free data announcement in Ontario (2020f), it is important to be aware that the pandemic occurred amidst ongoing tensions between the provincial government and teachers’ unions in the province. This section of the paper establishes a policy timeline (see Table 1) leading up to Ontario’s iPads and free data announcement (Ontario, 2020f), but also interweaves a discussion of issues of privatization and disaster capitalism.

	United Nations	Ontario
January 25th, 2020		First presumptive case of Covid-19 in Ontario and Canada
March 3rd, 2020		Minister Lecce announces opt-out options, but a plan to move ahead with eLearning for high school students
March 11th, 2020	WHO declares the Covid-19 Pandemic	
March 12th, 2020		Ontario announces initial closure of schools (K-12) between March 14-April 5 th ; later extended
March 20th, 2020		Learn at Home announced with website in English and French
March 31st, 2020		Teacher-led learning announced to extend Learn at Home; school closures extended
April 17th, 2020		iPads and free wireless data to support Learn at Home for students during the pandemic announced
May 19th, 2020		School closures extended until the end of the school year in June 2020

Table 1. Timeline of Events Relevant to the Shift to Online Education in Ontario During the Pandemic.

Canada had its first presumptive case of COVID-19 in Ontario on January 25th (Nasser & Blum, 2020; see Table 1). In the months before the pandemic, there were rotating teacher strikes in Ontario. A government plan to implement four (later reduced to two) mandatory online learning credits for high school students was one of the major reasons for the strikes (Paiken, 2020; Parker, 2020). On March 3rd, just one week before the pandemic was declared, the Minister of Education announced that parents would be able to opt-out of online learning for their children, but that “a made-in-Ontario online learning program” would go ahead (Ontario, 2020a). After the Minister’s announcement, a scholarly blog post posited that online learning in Ontario could be a “Trojan horse for cost-cutting and privatization” (Parker, 2020).

In an article published before the pandemic, Sears and Cairns (2019) identified that neoliberal logic has been present in Ontario’s educational policies since the 1990s, and the ideology crosses party lines. Sears and Cairns (2019) anticipated a continued neoliberal, “lean education” model under the Progressive Conservative leadership of Premier Ford (p. 395). They describe that the model “prepare[s] students for the conditions of lean production in workplaces and a narrower conception of citizenship without a social safety net” (p. 395).

Part of a lean education approach during a pandemic could include the expanded use of private technology services or datafication. Klein (2020) extended the idea of disaster capitalism during the pandemic to note that a smart agenda for a “Screen New Deal” was being pushed to transform public institutions, in ways that are “far more high-tech than anything we have seen during previous disasters.” Years prior to the pandemic, Watters (2013) already argued that “student data is the new oil” for companies that provide learning management software, email, cloud computing, search functionality, e-books and other educational services. According to Watters (2013), “companies are starting to push for the aggregation of student data into analytics tools that can be sold in turn back to the school.” The shift to online education during the pandemic could entrench or accelerate the commodification of student data.

Recognizing the potential privatization and disaster capitalism opportunities occurring both before and during the pandemic, Table 1 displays how online learning and the iPads and free data announcement emerged gradually in Ontario. Once the World Health Organization (WHO) declared a global pandemic on March 11th (WHO, 2020), the Ontario government announced the decision to close K-12 schools from March 14th to April 5th (Ontario, 2020b). The first week of the closures coincided with the March break holiday. On March 20th, the province announced the first phase of a program called Learn at Home, with a supporting website available in English and French (Ontario 2020c; Ontario, n.d.c).

On March 31st, an announcement extended school closures, outlined teacher-led learning and the continuation of the Learn at Home program (Ontario, 2020d). The idea that teachers should be “leveraging digital resources and identifying alternative forms of teacher-student connectivity, such as phone and mail” was announced, as well as the need to distribute laptops and devices from schools (Ontario, 2020d).

On April 17th, the Premier of Ontario, along with the Minister of Education announced the partnership to provide 21,000 iPads and free data (Ontario, 2020f; Premier of Ontario, 2020). During an address to the public, Premier Doug Ford described the program in the following terms:

For our children education is everything, and no matter what, their education must continue. And that means having the educational tools to facilitate online learning. That’s why we worked out a new partnership between Apple and Rogers with our Ontario school boards. We’re purchasing iPads at discounted prices for students in need. These iPads will have free wireless data and will help students from low income families continue their learning safely at home during this pandemic. (Premier of Ontario, 2020)

The Minister of Education, Stephen Lecce, stressed that government needed to make sure learning was “universal, accessible, and engaging for our students” (Premier of Ontario, 2020). Minister Lecce thanked Apple, Rogers, and school boards (Ontario, 2020f; Premier of Ontario, 2020). Tim Cook,

Chief Executive Officer of Apple Inc., retweeted a tweet from Minister Lecce announcing the partnership (Cook, 2020). Online learning was ultimately extended to the end of the school year in June 2020 (Ontario, 2020h).

Having contextualized the iPads and free data announcement (Ontario, 2020f) against the backdrop of privatization and disaster capitalism, the next section of the paper explores the role of internet access in relation to instantiating human rights for Ontario youth.

Is Internet Access a Human Right for Youth in Ontario?

Although Ontario attempted to enhance access to education through the internet during the pandemic, there is a much longer history of policies that inform internet access, education and children's rights. To trace this trajectory, this paper draws upon Eubanks (2007) who encouraged CI scholars to consider how the *distributive paradigm* for access can limit equity and social justice. The distributive paradigm frames "social justice as the morally proper distribution of social benefits and burdens among society's members" (Young, 1990 p. 18, quoted in Eubanks, 2007). A distributive paradigm can be thought to involve the distribution of goods, services, or commodities to help individuals achieve their rights and thereby social justice. Eubanks (2007) cautions however, that a distributive paradigm also constrains the technology equity agenda, because it does not account for all rights or social justice concerns.

When considering technology and equity in relation to Ontario students, the United Nations Declaration of Human Rights (UNDHR), proclaimed in the UN General Assembly in 1948, is one important starting point. Table 2 begins with the UNDHR, and also displays international, Canadian and Ontario based policy ideas, relevant to youth rights, education and internet access. Consistent with a distributive paradigm some goods or services that are fundamental for human rights are mentioned in the UNDHR, such as food and education. Commodities involved in internet access are not explicitly outlined in the UNDHR, but Article 19 is relevant. It states that "everyone has the right to freedom of opinion and expression; this right includes...to seek, receive and impart information and ideas through any media and regardless of frontiers" (UN, 1948). Article 19 is pivotal to position internet access as significant for human rights, including access to education under Article 26 of the UNDHR (UN, 2011, 2016). In addition to the UNDHR, the 1989 Convention on the Rights of the Child (CRC) is significant in relation to youth rights, which are now also positioned to intersect with the internet (Livingstone & Bulger, 2013; UN, 1989).

While internet access does not appear in the UNDHR or CRC, well-known human rights scholar Sen's (2005) work on a capabilities approach to rights is helpful. He stated, "it is possible to argue that human rights are best seen as rights to certain specific freedoms" and "duties" are required, "which are

centred around what others can do to safeguard and expand these freedoms” (p. 152). Expanding Article 19 will be considered next.

	United Nations	Canada	Ontario
1940s	United Nations Declaration of Human Rights (1948)		
1950s			
1960s			
1970s		Instant World report released (1971)	
1980s	Convention on the Rights of the Child (1989)	Canadian Charter of Rights and Freedoms established with the Constitution Act (1982)	
1990s		Information Highway strategy established and community access points in schools initiated (1994)	
2000s			
2010s	Internet access positioned to facilitate rights (2011 and 2016)	CRTC established USO of 50 Mbps for download and 10 Mbps for upload; a supporting broadband fund is announced (2016; 2018)	Up to Speed: Ontario's Broadband and Cellular Action Plan is established (2019)
2020s	WHO declares the COVID-19 Pandemic (2020)		Ontario closes its K-12 schools and later announces iPads and fee data for students in need (2020b, 2020f)

Table 2. Declarations, Policies and Ideas Relevant to Young Peoples' Rights and Internet Access During Covid-19 in Ontario, Canada.

Expanding Article 19 was attempted with the idea of a *right to communicate* (Hamelink, 2004). The right to communicate idea gained traction in Canada, through *Instant World: A Report on Telecommunications in Canada* (Canada, 1971; see also Raboy & Shtern, 2010), which anticipated the pivotal role of networked communications. The right was never formally established by the UN or Canada, but universality and equity were promoted through it. In the decade after *Instant World*, the Canadian constitution was updated (Canada, 1982). The Charter of Rights and Freedoms established freedom of

expression, “including freedom of the press and other media of communication” (Section 2b).

The aforementioned policy initiatives illustrate some conceptual foundations for internet access as a facilitator of human rights. In the 1990s and beyond, an array of policies and programs directly relevant to internet access and education have emerged in Canada, which further illustrate tensions between the distributive paradigm and the realization of rights. For example, Canada established an Information Highway Strategy in 1994 (Middleton, 2007), in the same year that the SchoolNet and the Community Access Program (CAP) were initiated to create community-based internet access points in locations like schools across Canada (see KPMG, 2000; Shade, 2010). Social justice goals were implicit in many aspects of the community connectivity programs. An evaluation of SchoolNet identified that it “helped improve social equity through provision of computers, Internet access, and technical advice to all Canadian communities, no matter how remote” (KPMG, 2000, p. iv).

While the ideal of greater equity is interwoven with many access programs, Middleton (2007) characterized that Canada’s approach to developing broadband internet infrastructures has been market-driven.² She advised the province of Ontario of the ongoing need for “provinces... or regional areas” to “develop... their own infrastructure in order to extend the benefits of broadband to their local citizens” (p. 15). Middleton identified that the unavailable, unaffordable, or lower quality access in rural or remote areas, including Indigenous communities, remain persistent challenges.

In the 2010s, a number of developments relevant to the internet and human rights emerged globally (Livingstone & Bulger, 2013; UN, 2011, 2016). In 2011, Special Rapporteur, Frank La Rue highlighted the “key role that the Internet can play in mobilizing the population to call for... better respect for human rights” (UN, 2011, p. 4). In 2013, Livingstone and Bulger (2013) recommended that the United Nations Children’s Fund (UNICEF) recognize information and communication technologies (ICTs) “as a cross cutting theme in all its work” and develop a global agenda on children’s rights in the digital age that was rooted in the CRC (p. 5).³ Finally, in 2016, an important statement that the UN adopted addresses the promotion, protection and enjoyment of human rights on the Internet for people of all age groups, and it made multiple references to the right to freedom of opinion and expression (UN, 2016, p. 1), but also to a range of other rights, such as “access to

² Broadband refers to fixed internet connections, that are generally delivered through cable or phone lines, with increasing desirable speed targets emerging over time (e.g., 1.5 Mbps, 5 Mbps, 50/10 Mbps). See CRTC (2019).

³ At the time of writing this paper, the UN Committee on the Rights of the Child was drafting a statement on children’s rights in the digital environment as discussed here: <https://www.ohchr.org/EN/HRBodies/CRC/Pages/GCChildrensRightsRelationDigitalEnvironment.aspx>

information on the Internet” facilitating “the promotion of the right to education” (p. 2).

Returning to the Canadian context, many aspects of a market-driven strategy and what Eubanks (2007) refers to as a distributive paradigm for facilitating internet access are evident in recent policy. In December 2016, a regulatory decision was made to establish universal service objectives (USOs) by the CRTC for Canadian telecommunications services (CRTC, 2016). The USOs established that Canadian residences and businesses should be able to purchase “fixed broadband Internet access” at “speeds of at least 50 megabits per second (Mbps) download and 10 Mbps upload, and to subscribe to a service offering with an unlimited data allowance.” Additionally, “the latest generally deployed mobile wireless technology should be available.” A broadband fund was established to encourage partners, including companies, to develop infrastructure (CRTC, 2016, 2018).

Scaffolding upon the CRTC’s USOs and broadband fund, the Province of Ontario announced a \$315 million dollar fund through the *Up To Speed* plan (Ontario 2019b). A recent CRTC report revealed that 1.6% of households in Ontario have *no* broadband access available to purchase, while 12.8% of households had access available only at a basic speed of 5 Mbps (CRTC, 2019, p. 278). Both the establishment of the USOs in Canada and Ontario’s plan reveal that infrastructure can be procured and access related products and services can be made available for purchase (see Eubanks, 2007), but this does not fully address equity or social justice considerations involved in facilitating connectivity with consideration of youth rights, which we will explore with the Access Rainbow and its application to the 21,000 iPads and free data case in Ontario (Ontario, 2020f).

Applying the Access Rainbow to the iPads and Free Data Announcement

Whether households had robust internet connections that met the USOs was significant in Ontario during the pandemic. The LTE data plans from Rogers could be expected to provide a comparable quality of service to the 50/10 Mbps USO necessary for youth to participate in online learning.⁴ Universal access, however, is about more than just network speed. The Access Rainbow model (see Figure 1) aims to provide a seven layer socio-technical model for universal access to empower Canadians and other users (Clement & Shade 1996, 2000). Clement and Shade (2000) emphasize that the middle of the rainbow, where services and content, like online learning are delivered, acts as the most critical part of the system.

⁴ Rizzatto, Fenwick and Fogg (2020) noted Canadian 4G download speeds during a nine-week period near or during the pandemic ranged from 61.6-63.8 Mbps.

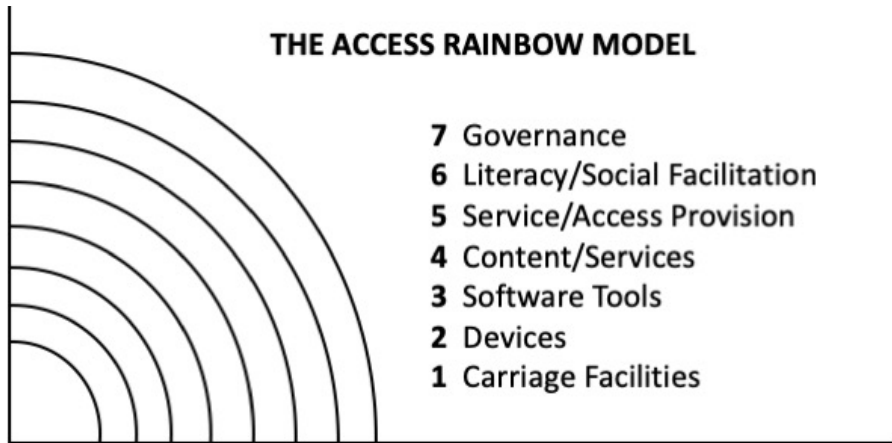


Figure 1. The Access Rainbow Model (created by the author to replicate ideas from a diagram in Clement & Shade, 2000).

While the government of Ontario announced a major partnership between Apple, Rogers and the school boards, local experiences to provide access for learners was nuanced, varied and involved extensive labour by school boards, frequently reflecting equity issues, and thereby a concern for human rights. This section of the paper explores how the Access Rainbow can be applied to understand the decision to distribute iPads, other devices, and to ensure internet access was available for Ontario learners during the pandemic. The analysis, which commences in Table 3, will reveal how application of the Access Rainbow to the case refracts and makes visible the various bands of universal access that are relevant to Ontario learners, as well as some of the limitations of a distributive paradigm for access.⁵

To understand Ontario's access initiatives, it is important to note that the Ontario education system serves 2,020,245 learners,⁶ and is home to 72 school boards (31 English Public, 29 English Catholic, four French Public, eight French Catholic) (Ontario 2019a, Ontario, n.d.a). To build on Table 3 and to illustrate the application of the Access Rainbow, examples will be drawn from a purposive selection of 12 school boards in Ontario, for which data could be located from newspapers, newsletters, and websites on the data plan and device distribution that occurred during the pandemic. The purposive sample of the 12 Ontario school boards selected for analysis serve students in the cities illustrated on the map in Figure 2 and the surrounding areas. In describing the purposive sampling undertaken for this paper, it is important to note that while the Children's Commissioner's Office in the

⁵ Table 3 draws upon an example in Shade and Dechief (2005).

⁶ The most current open data set from Ontario (2019a) with enrolment data for each school board was for the 2017-2018 school year.

United Kingdom released a dataset from the Department for Education outlining the devices and hotspots distributed nationally (Vilbert, 2020), no comparable data is currently available in Ontario, and an *ad hoc* approach was taken to allow for an expedient analysis.⁷

Access Rainbow Layer	Overview of the Layer in Relation to iPads and Free Data	Key Actors or Implementation Examples	Policy Questions
7. Governance	The decision to make iPads and free data available to Ontario learners	Ministry of Education in Ontario and the 72 school boards	How is an emergency plan for connectivity during a crisis formed? Who participates?
6. Literacy/Social Facilitation	The support work required to assist students to learn using digital tools, or alternatives	School boards, educators, and parents	What kind of technology support is available for educators and families?
5. Service/Access Providers	The organizations providing access	Rogers, internet service providers (ISPs) and school boards	What special measures provide access during a pandemic? Are companies and school boards involved?
4. Content/Services	Learn at Home website and linked materials, board or teacher created resources	Ministry of Education, school boards, educators, etc.	Is the provided content appropriate for learners? Does it reflect well-being, equity or rights?
3. Software Tools	Web browsers, virtual learning environments (VLEs) or cloud computing software	Google, Microsoft, D2L, Edsby, Apple, etc.	What programs or apps do students need to connect with their teachers and classmates and complete their schoolwork?
2. Devices	21,00 iPads announced by the province of Ontario	iPads or other devices such Chromebooks provided by boards	What are the appropriate and available devices for learners?
1. Carriage	Long Term Evolution (LTE) wireless data	Rogers, other providers	Can a data plan or access to carriage be procured? What does free (or affordable) data mean?

Table 3. The Access Rainbow Applied in Ontario During the Pandemic.

⁷ Freedom of information requests could have been submitted to school boards for data on devices and data plans, but it would likely have taken a year or two to collect the information.

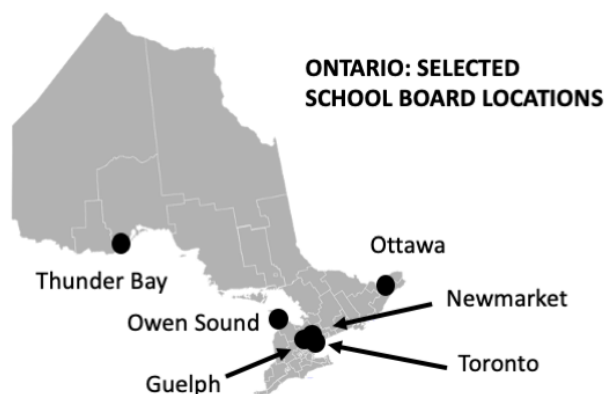


Figure 2. Ontario: Selected School Board Locations.⁸

Building out from the cities displayed in Figure 2, Appendix A provides an overview of information pertinent to 12 school boards located in the selected cities (six English Public boards, five English Catholic boards, and one French Catholic board) including the number of learners enrolled and data relevant to the Access Rainbow. In relation to the Access Rainbow, the number of data plans procured (layer 1 carriage), the number of devices distributed (layer 2 devices) and the virtual learning environments (VLEs) used by the school boards (layer 3 software) are listed in Appendix A. Appendix A also shows that the 12 school boards are responsible for educating 704,712 learners, or just over a third (34.9%) of the province’s enrolled learners.

The layer 1 carriage section of the Access Rainbow refers to the “facilities that store, serve or carry information” (Clement & Shade, 2000, p 37). Drawing from Table 3, one critical issue concerning carriage is, can a data plan or access to carriage even be procured? As per the provincial announcement 21,000 iPads with LTE data plans were being deployed (Ontario, 2020f). Consistent with the announcement, the Toronto District School Board (TDSB) deployed 6,5000 “internet-enabled iPads” (Teotonio & Rushowy, 2020), which represent approximately 31% of the total announced by the province (Ontario, 2020f). The TDSB iPads could be expected to draw upon the Rogers’ network to facilitate access to carriage. Although the Premier described the data plans as free for learners until the end of June (Ontario, 2020f), it is unclear if data plans were paid for by the school boards. Rogers statement about the partnerships was that “we have worked with our

⁸ The original map image displays electoral districts and was obtained from Wikimedia Commons under CC-BY-SA by Rishiyur1 https://commons.wikimedia.org/wiki/File:Ontario_Electoral_Districts_Map.svg, therefore the additions of cities and labels in Figure 2 are also shared under CC-BY-SA.

school boards, in collaboration with Apple, to help meet the educational needs of families and to provide *affordable* remote learning solutions” (Rogers, 2020, emphasis added), which suggests a payment of some kind was rendered.

In addition to TDSB’s use of internet enabled iPads to facilitate access to carriage, in Ottawa the Ottawa-Carleton District School Board (OCDSB) was noted to be deploying 1,700 internet hotspots. In their description of the hotspots, the board did not mention the brands of distributed devices, but they explained that they were “tablets with data plans” (OCDSB, 2020a). They described that “demand for Internet hotspots... [was] high” with the purchased hotspots expected in three waves, with the last devices arriving by the end of April. Although the TDSB and OCDSB use of iPads and tablets revealed some information about data plans that were distributed in the province, information on *how* the school boards facilitated access to carriage was sparse in the many news stories and the other materials that were analyzed as part of this research across the 12 boards. The OCDSB’s waves of distribution for their hotspots is consistent with a report that hotspot products were in short supply from manufacturers during the pandemic (McGill, 2020). It is probable that some school boards in Ontario where LTE coverage was available were unable to procure the desired devices to pair with data plans for learners.

Of additional relevance to carriage issues, the USOs established make obvious that the latest wireless LTE data options are not accessible across Canada. For example, in the Thunder Bay area, Conseil Scolaire de district Catholique des Aurores Boréales (CSDCAB), a French Catholic board that serves learners in a variety of locations in northern Ontario did not make mention of LTE or cellular data plans but instead stated, “we are in communication with the various Internet service providers in each of our regions and are trying to find solutions. Thank you for your patience” (CSDCAB, n.d.a). While LTE data coverage was available from Rogers in locations where some of the CSDCAB schools were located, it was not available in the town of Nakina.⁹ The comparative experiences of boards in Toronto, Ottawa and Thunder Bay show a range of challenges to facilitate access at the carriage level.

Layer 2 of the Access Rainbow deals with devices. From the data presented in Appendix A, an estimated 12.7% of learners may have received a device (e.g., iPad, Chromebook) from their school board, which was their primary interface to access educational content and services during the pandemic. While 21,000 *new* iPads were a major focus in the provincial announcement (Ontario, 2020f), discussion of the deployment of at least 6,640 new or existing iPads was uncovered for the 12 school boards that were explored. Most of the iPads (6,500) were deployed in Toronto by the TDSB, with

⁹ To substantiate this statement the author searched Rogers LTE coverage on April 30th, 2020 at <https://www.rogers.com/consumer/wireless/network-coverage-map>

additional numbers of devices shared in the Guelph area. The Upper Grand District School Board (UGDSB) deployed 65 iPads and the Wellington Catholic District School Board (WCDSB) 75 iPads (Khan 2020). Additionally, the Toronto Catholic District School Board “purchased about 6,000 Chromebooks and internet-enabled iPads” without the numbers of each type of device being clearly specified (Teotonio & Rushowy, 2020).

It is also clearly evident from Appendix A that iPads were not the only devices distributed by schoolboards locally. Netbooks and in particular Chromebooks were also frequently distributed by schoolboards in the local contexts that were examined. A tally of 31,200 Chromebooks were explicitly listed, including newly purchased devices and hardware already owned by five boards (UGDSB, York Region District School (YRDSB), Ottawa-Carleton District School Board (OCDSB), Ottawa Catholic School Board (OCSB), Bruce-Grey District School Board (BGDSB)) (Al-Shibeeb, 2020; BGDSB, 2020; Khan, 2020; OCDSB, 2020a; Pringle, 2020). An undetermined number of additional Chromebooks were also distributed by three other Boards (Wellington-Catholic District School Board (WCDSB), TDSB, and Toronto Catholic School Board (TCDSB)) (Khan, 2020; Teotonio & Rushowy, 2020).

The distribution of Chromebooks is perhaps unsurprising, because the device integrates well with Google Classroom, and Google’s cloud based educational software applications are noted for their popular adoption in regions across Canada (see Desson, 2018). Software represents the third layer in the Access Rainbow, and the possible integration of hardware with software led me to explore the virtual learning environment (VLEs) software used by school boards on an ongoing basis, but also during the pandemic. A VLE refers to cloud-based software that enables students and educators to access “digital resources, explore tools, and experience technology-enabled learning” (YRDSB, n.d.b). As listed in Appendix A, eight of the school boards examined were found to be using a VLE from Google, but sometimes non-exclusively. The Desire 2 Learn (D2L) VLE was located in use in four school boards and it is important to note that this software is licensed by the Ministry of Education in Ontario for all K-12 publicly-funded school boards in Ontario (D2L, n.d.). Noted as a D2L product feature it “integrates with third-party tools including Google Drive” (D2L, n.d.). While all boards may have access to D2L and make some use of it, their usage appears to vary greatly. Some school boards may use D2L minimally, while others appear to integrate D2L with Microsoft, such as the Bluewater District School Board (BWDSB), while another VLE, Edsby, was determined to be in use in the Thunder Bay area by the LPSB.

While information about the distribution of data plans (level 1 carriage), iPads and other devices (level 2 devices), and access to VLEs (level 3 software) are outlined in Appendix A, application of layers 4-6 of the Access Rainbow will be continue to be described to render visible the equity and justice oriented labour enacted by school boards and educators to facilitate

access, and to make it useful for learners. Level 4 of the Access Rainbow is the content/services and in the case of online learning during the pandemic, school boards and educators took a large range of approaches to delivering educational content and services. In a number of instances, students' overall well-being was emphasized in the board produced materials. For example, in Toronto a webpage titled "Remote Learning and Well-Being in the TDSB" was compiled to serve families during the pandemic (TDSB, n.d.). The TDSB outlined that "ensuring our students and community were supported *with the basics* in the beginning was critical" and they explain their efforts related to food, personal protective equipment, and computing together (TDSB, n.d., emphasis added).

Similarly, in the Newmarket area, the YRDSB (n.d.a) created a webpage called "Our Learning and Caring Plan" in response to the pandemic. The YRDSB page outlines that the board is committed to online learning that "support student and family well-being" and "is inclusive, caring, safe and accessible." The YRDSB page specifies varied supports that were available for diverse learners. Some possible accommodations for students with special needs were listed to include "providing real-time learning for students who cannot access online learning using electronic learning platforms." For learners from Indigenous communities, opportunities for online sessions with elders and knowledge keepers on topics including traditional medicines and stories were offered.

Level 5 of the Access Rainbow addresses service/access provision, and organizations relevant to this layer include the organizations that provide connectivity and services. These include, for example, Rogers and school boards. When Rogers was announced as a partner by the province (Ontario 2020f), the Minister of Education touted that with the iPads "students and families will not have to call into Rogers to have their devices set up" (Premier of Ontario, 2020). While the Minister emphasized the simplicity of set up, the actual steps taken by boards to make service and access possible were often far more complex.

It should also be noted that school boards and teachers needed to make huge efforts to ensure they understood Service/Access needs and could meet them appropriately during a pandemic. In the Guelph area, the public school board, UGDSB, had teachers who "called every single family... to determine if they needed a computer at home" (Khan, 2020). The UGDSB also "disinfected their [3,200] Chromebooks, packaged them and had them couriered to students' homes" (Khan, 2020). Taking a different approach, the WCSDS noted steps taken related to protecting privacy and the special needs learners in the board. The WCSDS noted "devices were wiped to ensure that there were no photographs, documents or other personal information on them," and that they delivered "200 special education devices comprised of iPads and Chromebooks with vision and audio support devices based on student needs" (Khan, 2020). After devices were ready, parents picked them

up from schools in a drive-through process where equipment was loaded into their trunks (Khan, 2020).

Level 6 of the Access Rainbow touches upon the literacy/social facilitation aspects of access. The pandemic situation created a unique situation for school boards, educators, parents and learners and our analysis here will focus on the technological help and support that was made available. The original announcement by the province about the iPads and free data outlined how Apple was providing technology support to “help teachers build engaging lessons for students at home” and “one-to-one virtual coaching” (Ontario, 2020f). From the data gleaned from the 12 school boards reported in Appendix A, Apple products were not the sole devices distributed. Analysis of materials from the news and school boards revealed numerous other forms of technology support for literacy/social facilitation of digital technologies during the pandemic to navigate a range of hardware and VLEs.

In the Ottawa area, the OCDSB’s webpage to support the provincial Learn at Home program was extensive and demonstrates the importance of mastering Google provided tools for diverse learners. The board provided links to a video titled, “Signing into Google and Getting into Google Classroom” and a link with further instructions for Google Translate (OCDSB, 2020c). To begin, users were prompted to “open your Chrome web browser” or instructed to download it (OCDSB, 2020b). English, French and Arabic help resources were prominently featured for Google tools, and OCDSB stated that part of their approach to Learn at Home was to be “culturally relevant and responsive” where “students have access to learning resources where they see themselves and their families represented and reflected” (OBDSB, 2020c).

The idea that parents may be required to provide technology supports at home was also demonstrated in the materials provided by other school boards. In the Newmarket area, the YCDSB (n.d., slide 5) provided their community with links and information about how to access the Google Classroom or D2L VLE. Additionally, they made available a technology support ticketing system for students or parents to file their issues. It was noted that “someone in Curriculum and/or IT will assist” (YCDSB, n.d., slide 7). The CSDCAB board based in Thunder Bay and serving learners in French, offered some tutorial links but also referred parents to moneureka.ca and a phone line for live technological support (CSDCAB, n.d.b).

The final layer of the Access Rainbow is governance, where the idea of who makes the decision about how connectivity should be enacted for students during a global health crisis is a key issue. Young peoples’ participation in decision-making concerning the governance of their internet access could be advocated for under Article 12 of the CRC, which supports that young people express their views on “all matters affecting the child” (UN, 1989). However, it is the long term decision-making by federal and provincial governments, the CRTC and school boards, which have largely shaped what connectivity options are feasible for learners during the

pandemic. Although the province announced the 21,000 iPads and free data (Ontario, 2020f) only some school boards participated, while other boards, such as the WCDSB in the Guelph area repurposed existing equipment (WCDSB, 2020), or in the case of the BWDSB in the Owen Sound area, waiting for the government to contact them (Wawa News, 2020). According to Member of Provincial Parliament, Marit Stiles, the Ontario government's announcement about iPads and free data was "misleading" and parents flooded school boards with requests for iPads (Wawa News, 2020).

Some level of confusion and uncertainty about how to provide access for students during the pandemic is not surprising. School boards have not historically provided internet access for their learners at home. Additionally, the Auditor General of Ontario noted in 2017-2018 that 50 out of 69 school boards who were surveyed, were discovered to have "no approved plans, policies, tools and procedures... [for] vital technology infrastructure and systems following a natural or human-induced disaster" (Office of the Auditor General of Ontario, 2018, p. 564). The varied responses by school boards to facilitate access demonstrate an enhanced role for VLEs and devices distributed to students at home. These efforts were by no means perfect and problems such as delays in procuring or delivering equipment were amongst the difficulties. Application of the Access Rainbow, particularly in the upper levels, reveals that school boards and educator were considering equity and social justice issues as they attempted to facilitate connectivity, often with a recognition of a spectrum of rights.

Discussion and Conclusion: Access Issues Made Visible through the Refraction Event of the Pandemic

This paper argued that the pandemic has acted like a prism, to make visible the various bands of the rainbow that are associated with implementing universal access in Ontario, Canada. Examining refractions from the Access Rainbow made visible during the pandemic revealed how a distributive paradigm and private interests are present amidst a province wide effort to strive towards universal access for learners. Simultaneously, much labour by school boards and educators was associated with facilitating access for young people, in ways that demonstrated equity considerations and a broad spectrum of youth rights. Three final key issues concerning human rights and universal access, big technology and disaster capitalism, and expanding the tech equity agenda and recognizing children's right within the digital age, will be discussed in this concluding section.

Universal Access Continues to be Enmeshed in a Distributive Paradigm

Although the internet was conceptualized to potentially contribute to Canadians' human rights decades ago (Clement & Shade, 1996, 2000), recent policy developments have strengthened this idea internationally (UN, 2011, 2016) and also in relation to children's rights (Livingstone & Bulger, 2013). Analysis of the case of iPads, other devices, and free data during the pandemic in Ontario with the bottom two layers of the Access Rainbow revealed how the distributive paradigm continues to be enmeshed with access initiatives in Ontario. Moreover, the allocation of data plans and devices is set against the backdrop of what Middleton (2007) described as a market-drive broadband strategy. The recent federal telecommunications regulation to establish USOs (CRTC, 2016), Ontario infrastructure (Ontario, 2019b), and 21,000 iPads and free data (Ontario, 2020f), continue to emphasize policy decision-makers' participation in parts of access, which are procured as infrastructure, or sold as commodities.

The closure of schools during the pandemic in Ontario also renders visible the problematic implications of shutting off community access sites, like schools, as providers of internet services. Under programs like CAP and SchoolNet in Canada, equity and right-oriented visions for internet access gained a foothold, which has not been relinquished, even when private interests remain prominent within the socio-technical infrastructures for access in public education.

Big Tech and Disaster Capitalism

Some degree of leveraging market opportunities during an emergency, which Klein (2007) calls disaster capitalism, is evident in the announcement to purchase 21,000 iPads with LTE data plans for deployment to learners during the pandemic (Ontario, 2020f). Analysis from the level 3 software layer of the Access Rainbow, however, more strongly revealed the existing presence of big tech in the public education system through VLEs and other software like browsers (OCDSB, 2020c), rather than a new push for privatization. A broader question for after the pandemic however, is *if* and *how* big tech interests have become further entrenched into public education?

In the rush to connect all young people during the pandemic, it appears unlikely that youth will be able to participate in decision-making about their digital connectivity as the CRC would encourage (Bailey et al., 2020). Additionally, it appears unlikely that students, parents or even educators, will have the meaningful opportunity to opt out of the privacy relevant terms and conditions established through technology procurement or account creation (Bailey et al., 2020). Without the meaningful ability to opt out of technology, corporations may gain new volumes of data from users who have few options but to provide their data to stay connected. The widespread usage of devices,

VLEs and cloud computing software during the pandemic, may also ultimately become tied to Ontario's vision to implement two mandatory eLearning courses for high school students. Concerns about privatization *vis-à-vis* eLearning and big technology corporations remain a concern as eLearning technology becomes more intensely deployed and utilized in the future to generate profits from data created in educational contexts (Bailey et al., 2020; Klein, 2020; Parker, 2020; Watters, 2013). Potential conflicts between rights (e.g., education and privacy) may also emerge more prominently in the future.

Expanding the Tech Equity Agenda and Recognizing Children's Rights Within the Digital Age

While the pandemic may create an opportunity for disaster capitalism, it may also more optimistically provide an opening to expand the tech equity agenda and advocacy efforts for children's rights. The involvement of school boards and educators in facilitating access for learners during the pandemic, rendered visible the strong efforts to infuse it with equity and a respect for a broad spectrum of youth or children's rights. When analyzing layers 4 to 6 of the Access Rainbow – content/services, service/access providers, and literacy/social facilitation – efforts to support the health, mental health, food security, and well-being of diverse and Indigenous learners were each noted through the websites and the access services, which were facilitated by school boards and educators. Layer 7, the governance level of the Access Rainbow, was examined to consider how school boards and the province grappled with partnerships to facilitate access.

With a note of hopefulness, the breakdowns, or lack of connectivity for school children during the pandemic, highlight the importance of achieving the USOs as soon as possible. Campaigns that developed during the pandemic such as #GetCanadaConnected are supported by an intersectional coalition of organizations that serve communities in Canada that are low-income, rural and Indigenous (OpenMedia, n.d). A coalition that cares about internet access and a broader spectrum of human rights for the residents of Ontario and Canada may seize the opportunity provided by the pandemic to expand the tech equity agenda, and perhaps youth advocates may also become involved in the future. Rather than positioning youth as merely agents to support the tech equity agenda, however, advocates for children's rights in Ontario must also recognize the role that internet access plays in facilitating a spectrum of rights for youth.

Acknowledgements

Thank you to the eQuality Project Team and SSHRC for their support (grant # 895-2015-1002). Additional thanks to Brittany Melton for editorial assistance on this manuscript.

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Appendix A: Application of the Lower Bands of the Access Rainbow to 12 School Boards in Ontario

Area	Board	Number of Students ¹	Number of Data Plans or Carriage Concerns	Number of Devices (e.g. laptops or tablets) ²	Percentage of Devices for Students	Virtual Learning Environment ³
Guelph Area	Upper Grand District School Board (UGDSB)	34,877	Unknown number (LTE) internet wifi access points	3,200 Chromebooks and 65 iPads 3,265 total	9.3% of students received a device (new or existing)	Google
	Wellington Catholic District School Board (WCDSB)	7,933	Unknown	567 of the total 568 were outlined to include 329 HP Netbooks, 75 iPads and 163 Netbooks. 433 unknown devices with some number of Chromebooks 1,000 total	12.6% of students received a device	D2L
Newmarket Area	York Region District School Board (YRDSB)	124,707	Unknown	18,000 Chromebooks 18,000 total	14.4% of students received a Chromebook (new or existing)	Google
	York Catholic District School Board (YCDSB)	53,728	Finalizing plans for internet access	1 device (computer/tablet) per family as needed Unknown total	Unknown	Google or D2L
Ottawa Area	Ottawa-Carleton District School Board (OCDSEB)	73,373	1700 data plans through internet hotspots	7,000 Chromebooks 7,000 total	9.5% of students received a Chromebook (new or existing)	Google
	Ottawa Catholic School Board (OCSB)	42,077	Unknown but hotspots provided	2,000 Chromebooks ordered to supplement devices owned by board Unknown total	4.7% of students received a new device	Google

Appendix A: Application of the Lower Bands of the Access Rainbow to 12 School Boards in Ontario (cont.)

Area	Board	Number of Students ¹	Number of Data Plans or Carriage Concerns	Number of Devices (e.g. laptops or tablets) ²	Percentage of Devices for Students	Virtual Learning Environment ³
Owen Sound Area	Bluewater District School Board (BWDSD) ⁴	16,456	Unknown	Unknown, board unsure of possible iPads from province as of April 24 th Unknown total	Unknown	D2L with integration with Microsoft
	Bruce Grey Catholic School Board (BGCDSB)	4,423	Unknown	1,000 Chromebooks 1,000 total	22.6% of students received a Chromebook	Google and D2L
Thunder Bay Area	Lakeland Public School Board (LPSB)	8,802	Unknown	1,000 existing devices 1,000 total	11.4% received an existing device	Edsby
	Conseil scolaire de district catholique des Auréoles boréales (CSDCAB)	804	Communicating with ISPs in area	Unknown Unknown total	Unknown	Microsoft
Toronto Area	Toronto District School Board (TDSB)	246,354	6500 LTE active iPad devices purchased	50,000 Chromebooks and iPads 50,000 total	20.3% of learners were identified to receive devices	Google
	Toronto Catholic District School Board (TCDSB)	91,178	Some iPads with internet included in total	6,000 Chromebooks and iPads 6,000 total	6.6% of learners received a device	Google
SUM		704,712 learners		89,265 devices	12.7% of learners received a device	

Appendix A: Application of the Lower Bands of the Access Rainbow to 12 School Boards in Ontario (cont.)

ⁱ Number of students obtained from the Ontario (2019a) open data set with 2017-2018 enrollment.

ⁱⁱ Sources of data for the carriage and devices columns are listed here. Guelph area numbers were obtained from Khan (2020) for both school boards. Newmarket area data was obtained from Al-Shibeeb (2020) for YRDSB, and YCDSB discussed one device per family on April 9th update (2020). Ottawa numbers for OCDSB were obtained from the board (OCDSB 2020a) and from the news for OCSB (Pringle, 2020). In Owen Sound the BWDSB status as waiting for information on iPads was sourced (Wawa News.com, 2020) and numbers for BGCDDB were obtained from the board (BGCDDB, 2020). Thunder Bay numbers for LPSB were reported by Diaczuk (2020) and CSDCAB's communication with ISPs was reported in an FAQ (CSDCAB, n.d.a). Toronto area numbers were obtained from the news (Teotonio & Rushowy, 2020).

ⁱⁱⁱ Virtual Learning Environments (VLEs) in use in the boards were obtained from a variety of websites, originally accessed between April-May 2020. The Guelph area UGDSB has extensive Google Classroom resources listed at <https://sites.google.com/ugcloud.ca/parenthelp/> and there was a D2L link off the homepage at WCDSB <https://www.wellingtoncdsb.ca/>. In the Newmarket Area, a Google login page was found for YRDSB at <https://google.yrdsb.ca/> and a YCDSB site <https://www.ycdsb.ca/covid-19/> lists Google Classroom and D2L. In the Ottawa area, OCDSB has Google repeatedly mentioned at https://ocdsb.ca/news/ocdsb_learn_at_home_parent_information and the OCSB has logins to the student portal <https://sites.google.com/a/ocsbstudent.ca/k-6/> that are Google hosted. In the Owen Sound area BWDSB provides links to D2L and Microsoft products here https://www.bwdsb.on.ca/Parents/Continuous_Learning and BGCDDB Google links were available through links in individual schools off of this Google sites page <https://sites.google.com/bgcdsb.org/bgcdsblog/home> and D2L and Google <https://sites.google.com/bgcdsb.org/st-marys-high-school-distance-home> are listed here. In the Thunder Bay area LPSB, Edsby is linked off of the board homepage <https://www.lakeheadschoools.ca/>. The French language Catholic board CSDCAB provided information about Microsoft Teams here CSDCAB here <https://www.csdcab.on.ca/nouvelles/apprendre-la-maison/appui-technologique/>. In the Toronto area the TDSB has a Google page here <https://sites.google.com/a/tdsb.on.ca/tdsbtechnology/student-email> and the TCDSB describes logging into your board Google account here <https://sites.google.com/tcdsb.ca/tcdsbcurriculumdept/home>

^{iv} At the time of publication, the link https://www.bwdsb.on.ca/Parents/Continuous_Learning was no longer active, but an Internet Archive link was located, with the May 8th, 2020 version available at: https://web.archive.org/web/20200508045915/https://www.bwdsb.on.ca/Parents/Continuous_Learning