

Adult Education: The Missing Piece to Bridging the Digital Divide

Christine Pinsent-Johnson and Matthias Sturm

IN BRIEF

The use of online services to carry out essential everyday activities is making Canada's digital divide increasingly evident. This paper argues that the divide extends beyond mere access to technology and is fundamentally about the ability to benefit from it, which hinges on digital literacy. Canada's adult education programs are well positioned to offer essential digital learning opportunities but are currently excluded from the digital learning conversation. The paper advocates for sustained core funding for adult education programs and establishing a national platform for resource sharing. It also calls for connecting community-level adult education with broader digital literacy efforts through a cross-sectoral network to ensure equitable access to digital resources and support.

EN BREF

La nécessité de l'Internet pour accomplir des activités quotidiennes essentielles met en évidence la fracture numérique au Canada. Cette étude avance que cette fracture dépasse le simple accès aux technologies, mais est plutôt fondée dans la capacité à en tirer profit, ce qui nécessite un certain niveau de littéracie numérique. Les programmes d'enseignement aux adultes sont bien outillés pour offrir des opportunités de formation sur les technologies numériques, mais ils sont présentement écartés des conversations sur le sujet. Cette étude recommande plus de financement de base durable pour les programmes d'enseignement aux adultes et l'établissement d'une plateforme nationale de partage des ressources. Elle préconise également de relier l'éducation des adultes au niveau communautaire à des efforts plus larges en matière de littéracie numérique par l'intermédiaire d'un réseau intersectoriel qui garantirait un accès équitable aux ressources et au soutien numériques.

ABOUT THIS PAPER

This Insight was published as part of the Empowering Canada's Workforce research program, under the direction of Natalia Mishagina. The manuscript was copy-edited by Bernard Simon, proofreading was by Zofia Laubitz, editorial co-ordination was by Étienne Tremblay, production was by Chantal Létourneau and art direction was by Anne Tremblay.

Christine Pinsent-Johnson is a policy and research specialist at AlphaPlus. She has more than three decades of experience in the adult learning sector.

Matthias Sturm is an adult education researcher and evaluator. His scholarship focuses on emerging digitalities and equitable approaches in converging digital spaces.

To cite this document:

Pinsent-Johnson, C. & Sturm, M. (2024). *Adult education: The missing piece to bridging the digital divide*. IRPP Insight No. 55. Montreal: Institute for Research on Public Policy.

The opinions expressed in this paper are those of the authors and do not necessarily reflect the views of the IRPP, its Board of Directors or sponsors. Research independence is one of the IRPP's core values, and the IRPP maintains editorial control over all publications.

IRPP Insight is a refereed series that is published irregularly throughout the year. It provides commentary on timely topics in public policy by experts in the field. Each publication is subject to rigorous internal and external peer review for academic soundness and policy relevance.

If you have questions about our publications, please contact irpp@irpp.org. If you would like to subscribe to our newsletter, *IRPP News*, please go to our website, at irpp.org.

Illustration: Shutterstock.com
ISSN 2291-7748 (Online)

CONTENTS

Highlights 3

Faits saillants 4

A New Form of Inequality..... 5

Components of the Digital Divide 6

Current Solutions to Close the Digital Divide 12

The Role of Adult Education Programs14

Policy Interventions to Bridge the Digital Divide Via Adult Education 20

Our Recommendations.....24

References..... 26

HIGHLIGHTS

As our daily lives keep moving online, Canada's digital divide becomes ever more obvious and disquieting.

Most of us tend to assume that this inequity in our society refers to varying degrees of internet access. As a result, policies designed to address it have centred up to now on providing reliable broadband connections for remote areas and making internet plans more affordable for marginalized households.

This paper argues, however, that the digital divide goes beyond mere access to technology. Equally important — perhaps even more so — is whether Canadians can actually use technology for their benefit, and that depends on their ability to acquire and apply the skills necessary to navigate the digital world. While access to devices and internet connections can certainly foster digital skills, this knowledge is incomplete and unequally distributed without formal learning opportunities.

Canada's adult education programs are well positioned to offer digital learning opportunities as part of their upgrading, vocational, language and literacy skills curriculums. Yet they remain largely excluded from the digital learning conversation. This paper urges Employment and Social Development Canada to work with provincial and territorial governments to:

- **Ensure the provision of sustained core funding to provincial and territorial adult education programs.** This funding would stabilize operations, facilitate long-term planning and reduce administrative redundancies, particularly by ensuring predictable support for equipment purchases, IT infrastructure and software licensing. Additionally, we advocate the creation of a national platform for educators to share learning materials and best practices.
- **Connect community-level adult education initiatives with broader digital literacy efforts.** We call for the establishment of a cross-sectoral network to coordinate programs aimed at enhancing digital skills and access for underserved communities. By leveraging existing partnerships and forging new collaborations, such initiatives can serve as vital hubs for integrating informal and formal learning, thereby ensuring equitable access to digital resources and learning opportunities across diverse Canadian communities.

FAITS SAILLANTS

Plus notre vie quotidienne migre vers l'informatique, plus la fracture numérique devient apparente et inquiétante.

On a coutume de penser que cette iniquité sociale est due à différents niveaux d'accès à Internet. Conséquemment, les politiques conçues pour s'attaquer à ce problème se concentrent sur l'offre d'un accès fiable dans les régions éloignées, et abordable pour les ménages marginalisés.

Cette étude avance toutefois que la fracture numérique dépasse le simple accès à la technologie. La capacité d'utiliser la technologie à son avantage est tout aussi importante (si ce n'est pas plus) et elle dépend de l'acquisition et de la mise en application des compétences permettant de naviguer dans le monde numérique. Même si l'accès à des appareils et à une bonne connexion Internet aide à acquérir des compétences, elles restent incomplètes et mal distribuées sans possibilité d'apprentissage formel.

Les programmes d'éducation aux adultes du Canada sont en bonne position pour enseigner les compétences numériques dans le cadre de leurs programmes de mise à niveau, de formation professionnelle, de langue et d'alphabétisation. Mais ils restent exclus des conversations sur l'enseignement des compétences numériques. Cette étude presse Emploi et Développement social Canada de travailler avec les gouvernements provinciaux et territoriaux afin de :

- **Assurer le financement de base durable des programmes provinciaux et territoriaux d'éducation des adultes.** Ce financement permettrait de stabiliser les opérations, de faciliter la planification à long terme et de réduire les redondances administratives, notamment en garantissant un soutien prévisible pour l'achat d'équipements, l'infrastructure informatique et les licences de logiciels. En outre, nous préconisons la création d'une plateforme nationale permettant aux éducateurs de partager du matériel d'apprentissage et de bonnes pratiques.
- **Lier les initiatives d'enseignement aux adultes de niveau communautaire avec les plus vastes efforts d'alphabétisation numérique.** Nous appelons à la mise en place d'un réseau intersectoriel pour coordonner les programmes d'amélioration des compétences numériques et l'accès des collectivités mal desservies. En tirant parti des partenariats existants et en établissant de nouvelles collaborations, ces initiatives peuvent servir de carrefours vitaux d'intégration de l'apprentissage formel et informel, garantissant ainsi un accès équitable aux ressources numériques et aux possibilités d'apprentissage dans les diverses communautés canadiennes.

A NEW FORM OF INEQUALITY

Our interactions with organizations, government services and corporations these days occur principally online. This means that internet access and digital skills have become basic requirements for work, education and general participation in society. But depending on income, age and where they live, people in Canada may find themselves on different sides of the “digital divide” — the gap between those who have access to digital technology and those who do not (Haight et al., 2014). The COVID-19 pandemic clearly demonstrated the inequity of the digital divide when rapidly implemented policies effectively excluded many individuals, families and communities from vital public services and information sources.

This paper argues that, as a new form of inequality, the digital divide goes beyond access to adequate and affordable connections and devices. Rather, it relates to the benefits that users derive from online services, resources and networks through digital skills – in other words, the technical ability to use digital tools – acquired while interacting with technology. Policies limited to connecting users with technology essentially imply a do-it-yourself approach to digital learning, resulting in inadequate and unequally distributed digital skills. Therefore, while improving the accessibility and affordability of internet services is undoubtedly necessary, it is not sufficient to bridge the digital divide. Accessibility must be supported by formal learning opportunities offered by adult education programs, libraries and community organizations.

We argue that Canada’s adult education and skills development system¹ should take a more prominent place in bridging the divide between those who have the necessary digital skills to thrive in the modern economy and those who don’t. Adult education providers are tightly integrated into local communities across Canada and are able to skillfully navigate the intricacies of educating adults, from youth to seniors. Moreover, by incorporating digital skills training in their upgrading, vocational, language and literacy skills curriculums, adult education programs can do more than teach digital skills. They can help learners acquire digital literacy – the ability to use digital skills and understand multimedia environments confidently and critically for purposes that meet diverse needs.

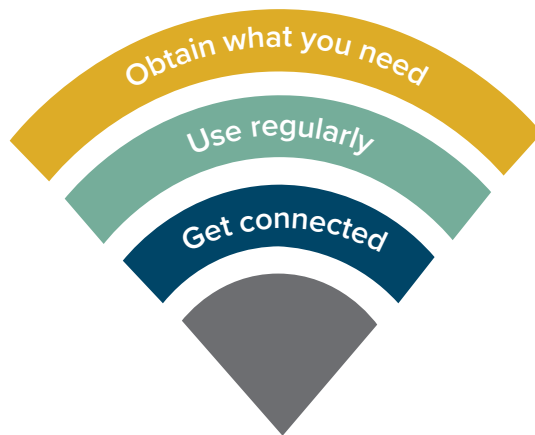
However, adult education programs are mostly excluded from the digital learning conversation as we know it. The already marginalized and underfunded adult education field does not always have the resources needed to take on the added complexity and costs of digital learning such as acquiring and maintaining the necessary hardware and software, technical support, specialized learning materials and ongoing professional development for educators. Moreover, formal learning must be complemented with informal digital learning opportunities, both in and outside the classroom.

¹ The system includes basic skills and literacy learning up to a high school level, English or French as a second language instruction, vocational and employability training, and workplace learning including pre-apprenticeship (Council of Ministers of Education, Canada, 2012).

COMPONENTS OF THE DIGITAL DIVIDE

We define the components of the digital divide in terms of three interrelated layers, as depicted in figure 1. The first layer, *Get connected*, refers to differences in how people connect to the internet. The second layer, *Use regularly*, refers to differences in how people engage online and develop digital skills. The third layer, *Obtain what you need*,

Figure 1. Layers of the digital divide



Source: Adapted with some changes from Pinsent-Johnson and Sturm (2020).

refers to differences in how people benefit from their interactions with services, resources and networks that are available only online.

Get connected: Availability and affordability

The digital divide begins with connectivity, which has two main components: the availability of broadband internet where people live and work, and the affordability of internet connection plans and up-to-date devices.

The first component – availability – has been a longstanding obstacle for Canada’s rural and remote areas. In 2023, access to broadband services that met the Canadian government’s target download speed of 50 megabits per second (Mbps) and upload speed of 10 Mbps with unlimited monthly data transfer (often referred to as “50/10 Mbps unlimited”) was available in only 62 per cent of households in rural communities and 43 per cent of households on First Nations reserves, compared with a national average of 91.4 per cent (Canadian Radio-television and Telecommunications Commission, n.d.).

Broadband connection in rural areas also tends to be more expensive than in urban centres because there are fewer providers (Canadian Radio-television and Telecommunications Commission, 2020). The pandemic exacerbated the problem by forcing hundreds of thousands of Canadians in rural areas into paying data overages that were “two, three, even four times more than usual,” according to a Go Public investigation by the CBC (Johnson & Uda, 2020).

Besides being inaccessible and despite Canada declaring internet access a basic right in 2016, a high-speed connection remains unaffordable for many Canadians, regardless of where they live (Kupfer, 2016). Only two-thirds of low-income households had internet access at home in 2017, compared to 98.5 per cent of high-income households. Lower-income households also spend more of their income on communication services. Those in the lowest income quintile (earning less than \$32,915 a year before deductions) spend 9.1 per cent of their income compared to 1.8 per cent by those in the highest income quintile, earning over \$132,809 (Canadian Radio-television and Telecommunications Commission, 2020).

Those with low incomes also tend to rely more on cellphones than a desktop or laptop as their primary means of communication and internet access (Canadian Radio-television and Telecommunications Commission, 2020). Accessing the internet on a cellphone is not only more costly on data plans than using a personal computer with a household broadband connection but having to rely on a cellphone creates disadvantages when accessing online resources and services. Essential interactions made primarily on cellphones are prone to be less efficient and less secure, possibly resulting in additional connection costs and data privacy issues when using Wi-Fi.

These statistics do not differentiate between Canadians who access the internet using pay-as-you-go and low-data plans or public Wi-Fi. A regional snapshot has found that 23 per cent of adults in the Waterloo region of Ontario do not have an internet connection at home, relying instead on public Wi-Fi and a local library's Wi-Fi hotspot loan program (Sharkey, 2015). Libraries are on the frontline of digital equity, ensuring people's right to information and the resources they need, providing access to computers, free Wi-Fi and innovative technology for those with low incomes and limited access. A study initiated by the Toronto Public Library showed that over half of respondents who used technology services at participating Ontario public libraries reported that this was their only access to technology and the internet (Toronto Public Library, 2020). The problem is that relying on public Wi-Fi or temporary access as the primary connection mode or a supplement to low-data and pay-as-you-go plans comes at the cost of substantial time, effort and planning. Connections of this kind also expose personal information and transactions to security risks and privacy breaches.

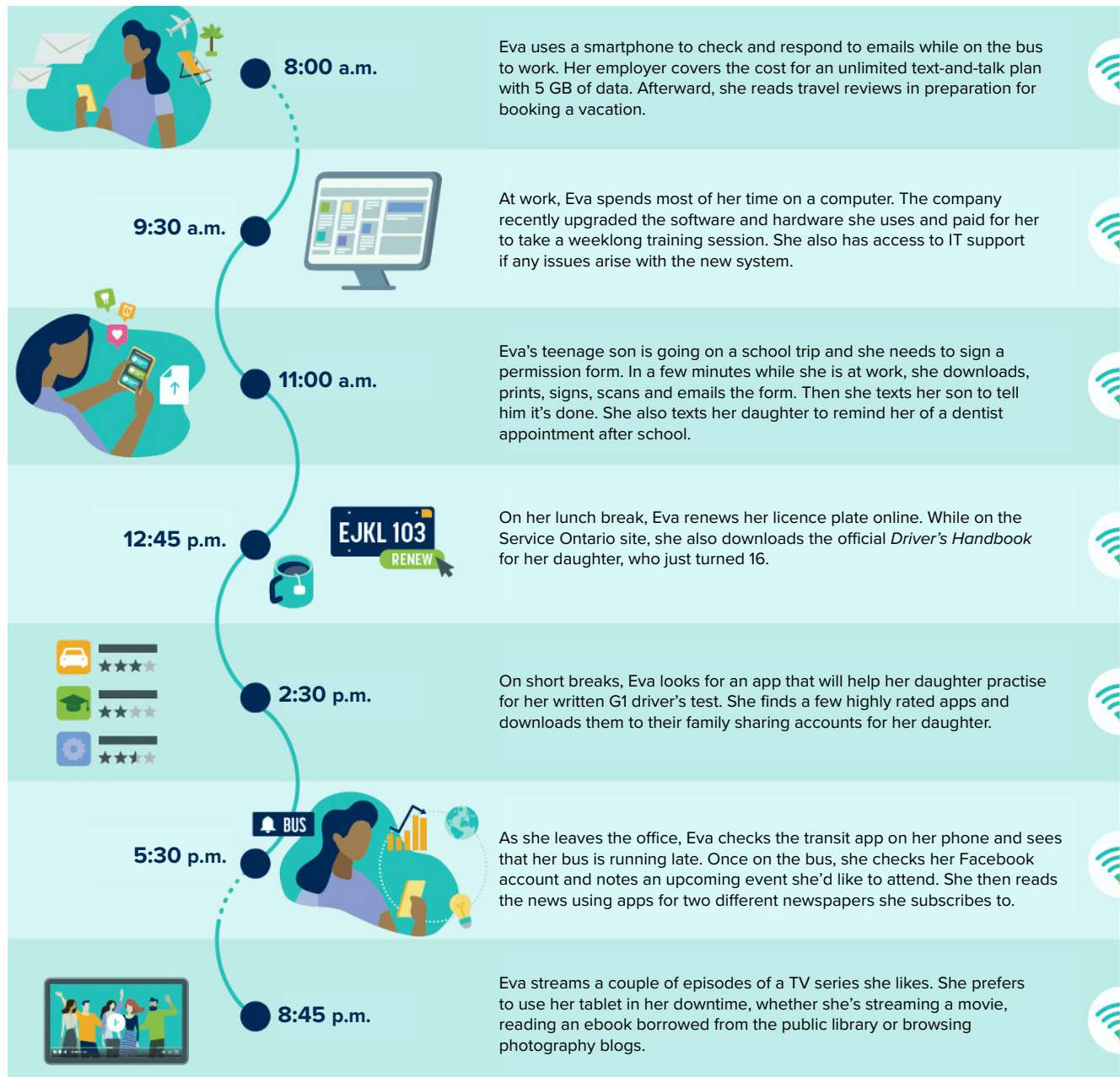
Use regularly: Internet use and digital skills

People need specific skills to engage with and take advantage of digital technology effectively. These skills can be acquired through the everyday use of technology, contingent on digital demands, networks of support, and broader socio-economic patterns and opportunities. Limited access to reliable high-speed internet means fewer opportunities to develop these digital skills.

For those of us working, learning and relaxing in digital spaces, it is nearly impossible to imagine not having an “anytime, anywhere” digital connection. How is one's day disrupted when internet access is not readily available or unreliable; when devices are nonexistent, too old and too slow; when there is no printer or scanner at home; or when important information, resources and communications are relayed via social media that requires an unlimited internet access or data plan that one cannot afford?

To demonstrate how limited internet access affects people's lives and dispel an idealized vision of digital citizens, we developed two illustrations based on statistical analysis, literature review and student interviews. The first illustration (figure 2a) tracks a day in the life of Eva, who enjoys seamless internet access. The second (figure 2b) features Sandra, who has only limited access. Eva easily engages with daily tasks in digital spaces at home, in transit and at work. She responds to emails on the bus, renews her licence plate online, and prints, signs, scans and returns a form.

Figure 2a. A day in the life with seamless internet access



Source: Reprinted from Pinsent-Johnson and Sturm (2020).

Figure 2b. A day in the life with limited internet access



By contrast, Sandra spends a big chunk of her day navigating digital hurdles to accomplish what ought to be quick and easy tasks. They include bus trips to the local library for internet access and a local supply store to print and scan a form. To save time and her phone's data plan, Sandra must stay at the library to accomplish other tasks requiring technology, such as checking her college application and searching for a solution to her back pain. A lack of privacy, a noisy environment, extra costs and a lack of assistance are just a few of the barriers she must contend with.

Without an adequate connection and up-to-date device, including peripherals such as a scanner and a printer, many digital activities may have to be abandoned or avoided altogether. Time spent online is curtailed since internet access requires planning, effort and careful calculation of costs, especially in a public place without sufficient privacy or adequate on-the-spot troubleshooting assistance.

Moreover, not all digital practices facilitate true fluency with digital technology. Relying solely on a smartphone rather than a computer for communication implies more regular use of voice messages, video telephony and social networks (Grotlüschen et al., 2021). Complex activities, such as completing an online form, using a learning management system or undertaking extensive web searches, are challenging, if not impossible, on a smartphone. As a result, the range of digital skills developed during these activities is severely limited.

The connection challenges are compounded for those without a job or whose work involves low, if any, digital demands. Many people are exposed to new technologies and new digitally mediated processes in the workplace, and technology adoption is often accompanied by employer-provided training and informal learning opportunities, for example, from colleagues.

To assess digital proficiency among adults, researchers often use the Problem-Solving in Technology-Rich Environments test of the OECD's Programme for the International Assessment of Adult Competencies (PIAAC). This test measures the ability to use digital technology, communication tools and networks to acquire and evaluate information, communicate with others and perform practical tasks (Organization for Economic Co-operation and Development, 2012).²

On the face of it, Canada did well on the test in 2012, the most recent year for which results are available (Statistics Canada, 2013). A larger proportion of Canadian respondents aged 16 to 65 (81 per cent) completed the test than the OECD average (74 per cent). Of the 19 per cent of Canadians who did not complete the test, about half had no prior experience with computers or failed the basic test. The proportion of Canadians who scored at higher proficiency levels (levels 2 and 3) was also above the OECD average (37 per cent versus 34 per cent).

² The ability to find and use information using computers and computer networks represents only a fraction of what is involved in being proficient with modern technology, which also includes the ability to install, set up and troubleshoot hardware and software, even at a basic level, as well as the ability to use it. Nevertheless, the PIAAC test score is the most often used measure of digital proficiency, consistent across countries and over time.

However, Canada's above-average overall performance obscures a gap between those who scored at the lowest and highest levels. While the percentage of Canadians who scored at the highest level was similar to the OECD average (7 per cent versus 6 per cent), the percentage of those who scored below level 1 in Canada was higher than the OECD average (15 per cent versus 12 per cent). The eight-percentage-point difference between Canadians who scored at the highest and lowest levels is not as big as that of Americans or Belgians (11 percentage points); however, it is not the smallest either. In comparison, Australians had only a three-point difference between the highest and lowest levels, primarily due to the lower proportion of respondents scoring at the lowest level (9 per cent).

Lower scores reflect testing conditions and broader socio-economic circumstances that hamper literacy and digital skills development. The most consistent predictor of results is education level and educational experiences (Green et al., 2015). Lower proficiency tends to be more common among older respondents, immigrants, Indigenous people and official-language minorities (though with some exceptions). Literacy scores of older test-takers tend to decrease as they age (Green & Riddell, 2007). Immigrants not educated in English or French, the languages used for the test, are at a disadvantage (Xenogiani, 2017). Indigenous people could face similar language challenges in addition to their negative experiences in the education system, including streaming and lack of access to secondary schools in their communities. Test scores also tend to be lower for people in jobs that don't demand a high level of literacy and digital fluency (for example, trade, production and manufacturing occupations) and may not require a high school diploma (Statistics Canada, 2013). Lower scores are also correlated with low income (Heisz et al., 2016).

The data discussed above are from 2012.³ Arguably, things have improved since then. However, the results of a more recent ranking of digital access, use and skills published by the United Nations show that Canada has in fact been losing ground, dropping from 21st in 2010, its highest ranking, to 29th in 2017 (International Telecommunications Union, n.d.).

Obtain what you need: Taking full advantage of digital technology

A lack of opportunity to develop digital skills prevents people taking full advantage of essential services they are entitled to receive, not to mention depriving them of potentially life-changing education and employment. The ripple effects of the digital divide also reach beyond the individual by excluding people from participation in consumer research and government consultations, thereby exacerbating social inequality (van Deursen & van Dijk, 2013).

One example is e-governance, which introduces new digitally mediated literacy practices as more services, resources and information move online. Users must grapple with complex interfaces, password protocols and navigation structures to obtain the services they are eligible for. They must overcome each of these barriers to access information such as eligibility criteria, the application process, documents, forms and regulations.

³ The next cycle of PIAAC data collection began in 2022, delayed by a year due to the COVID-19 pandemic. New PIAAC data will be released in the fall of 2024 (Statistics Canada, 2020).

Similarly, e-recruitment and automated resumé-screening systems require learning new practices to transpose employment experience into text recognizable by screening software. The digital, language and literacy demands are complex, requiring technical knowledge across various platforms to upload resumé, an in-depth understanding of language, and workarounds to ensure applicants can get past screening filters.

The Canadian government's COVID Alert app, launched in August 2020, could be used only on mobile phones less than five years old because it relied on Bluetooth technology that older phones didn't have. As Christopher Parsons, a senior research associate at the Citizen Lab of the Munk School of Global Affairs and Public Policy, noted, "the worst affected by (the pandemic) are Black, Indigenous, people of colour, people who often have a lower socio-economic bracket. Who's not going to be able to install the application? That same group ... that's a problem" (Wells, 2020).

Marit Stiles, leader of the Ontario New Democratic Party, observed that the stakes had never been higher for marginalized people who would be further disadvantaged by not being able to use the app: "We know that elderly folks, seniors, new Canadians, racialized people are the most likely to contract or be affected by COVID-19 ... then it might be a bit problematic that the app only works with the fanciest or priciest new phones" (Wells, 2020).

When Ontario cancelled in-person classes during the pandemic, adults without reliable or affordable internet connections and up-to-date devices at home faced obstacles accessing educational opportunities, such as literacy and basic skills programs. Some learners who regularly attended these programs had to rely on mailed workbooks and support by phone. Some dropped out due to their lack of access while the programs were suspended. Others pivoted to remote online learning and had to learn how to use a digital device without formal or informal supports. Remote online learning was by no means a smooth transition for many due to their unfamiliarity with devices, including even those on loan from school boards with dedicated technical support departments.

CURRENT SOLUTIONS TO CLOSE THE DIGITAL DIVIDE

We have been aware of the connectivity gap for some time. In 2018, a report by the Canadian Internet Registration Authority highlighted obstacles such as a lack of infrastructure in remote and rural areas, a lack of digital access and literacy among marginalized groups, a lack of understanding around security and privacy risks, and funding barriers to address these needs (Canadian Internet Registration Authority, 2018). The report made several recommendations: prioritizing first-mile connectivity and encouraging community ownership and local innovation; funding basic digital literacy skills; embedding cybersecurity and privacy training in learning opportunities; developing a national internet affordability program; reviewing funding models; and finding ways to share best practices.

The federal government has funded several programs that provide accessible internet to select population groups. For example, the Connecting Families initiative administered by Innovation, Science and Economic Development Canada provides low-income families

across Canada with a \$10 or \$20 internet plan and a refurbished computer. As of March 2022, the initiative had a budget of \$13 million to support up to 220,000 eligible families, and had distributed 50,000 refurbished computers. Initially, eligibility was confined to those receiving the maximum amount under the Canada Child Benefit, but it has since been extended to low-income seniors (Innovation, Science and Economic Development Canada, 2022a).

Prior to the Connecting Families initiative, Industry Canada administered the Community Access Program, which opened sites equipped with computers and internet access, first in rural areas and then in urban communities for the benefit of Indigenous Peoples, Francophones, newcomers, seniors and people with low incomes or low education (Geist, 2012). Launched in 1994, the initiative was terminated in 2012 because it had “outlived its usefulness as a means to bring the internet to communities across Canada” and was “less aligned with the current priorities” of the federal government (Innovation, Science and Economic Development Canada, 2009). This rationale was not shared by the program’s users, who fought to maintain the access sites, some of which were eventually taken over by libraries and community organizations. Some provinces, like Nova Scotia, stepped in to keep sites open (@NS, n.d.).

Two of Canada’s largest telecommunications carriers – Rogers and TELUS – offer limited access programs to some low-income communities and population groups. Rogers’ Connected for Success program offers basic internet service for \$10 a month in Ontario, New Brunswick and Newfoundland and Labrador. Depending on the province, eligible groups include residents of subsidized housing and recipients of various types of income support. TELUS’s Connecting for Good program offers a plan for \$10 or \$20 a month to Alberta and British Columbia residents, including low-income families, youth no longer eligible for special social services and people with disabilities. The offer also includes used phones for youth emerging from foster care and customized technology to help people with disabilities who struggle to use regular smartphones and tablets.

While these initiatives are a step in the right direction, they fall short of universal affordable access. For example, while the Connecting Families program is national in scope, it excludes families without school-aged children. In addition, the effort needed to apply for the programs has clearly been underestimated. For example, to qualify for low-cost internet, Rogers’ Connected for Success Ontario program requires recipients of Ontario Works and the Ontario Disability Support Program to submit a form that needs to be downloaded before it can be filled in. Anyone without an email address cannot likely access the Ontario Works portal. And anyone without a phone that can receive text messages for account validation cannot get an email address. Applicants thus face an avalanche of barriers: no phone, no email, no application, no connection. Some people are able to find workarounds to apply for subsidized connection plans. Thus, families with school-aged children may contact a teacher or principal to request access codes on their behalf. However, we should not accept such cumbersome processes as solutions to the poor design of the programs; instead, they underscore how current policies exacerbate existing barriers and inequities.

THE ROLE OF ADULT EDUCATION PROGRAMS

While initiatives that provide reliable and affordable internet connection and hardware may be necessary, they are insufficient to develop comprehensive digital skills that rely on navigating and understanding multimedia information. Instead of fully participating in online spaces and accessing the services and supports they are entitled to, all too many adults find their experience with digital learning filled with wrong turns and pitfalls. Useful first points of contact – such as a librarian helping a senior to access a public computer, a friend helping to install an app or a social worker setting up an account – are limited and do not always provide a learning experience. Haphazard efforts to troubleshoot technical issues, find relevant information, organize files and passwords, and determine effective and safe practices tend to be piecemeal, tentative and quickly forgotten.

Moreover, a focus on improving broadband access implies a do-it-yourself approach. Learning to use technology is “downloaded” onto individuals, and bridging the digital divide becomes exclusively a personal responsibility. Yet a vast array of factors affect people’s access to and use of technology, such as age, income, education, location, literacy level, digital demands and support. Personal efforts alone cannot overcome these barriers without the resources and opportunities offered by formal instruction and a training support system.

Adult education programs offer unique digital learning opportunities

Digital skills development has received a lot of attention recently. Several reports have attempted to define and classify digital skills and have mapped digital learning pathways and providers, from grassroots initiatives to short-term projects and post-secondary programs (Canadian Internet Registration Authority, 2021; Cukier et al., 2020; Huynh & Malli, 2018; Munro, 2019; Shortt et al., 2020). Not included or even acknowledged in these reports is the role of Canada’s adult learning and skills development system, which offers a variety of digital learning opportunities in every province and territory attended by hundreds of thousands of learners annually (200,000 in Ontario alone) (Ministry of Advanced Education and Skills Development, 2017).

The current system of adult learning and skills development is complex, with a mixture of federal and provincial funding sources and providers, including non-profits in the community, school boards/districts and colleges.⁴ Government funding supports the following programs, which integrate digital learning in various ways.

- Secondary-completion programs for adults, which are separate from the regular system for adolescents and lead to the same diploma, a modified adult diploma or an equivalency credential (funded by provinces and territories).
- Language instruction programs for newcomers (funded by the federal government).
- Adult language training programs (funded by the largest provinces).

⁴ For an in-depth analysis of one provincial adult learning system, see Silver (2022).

- Adult literacy programs that support some first-generation immigrants and Canadian-born learners who have low levels of literacy and may also have learning disabilities and other learning challenges (funded by the provinces and territories).
- A variety of professional bridging, workplace learning and employment training initiatives that may be integrated with the above or operate separately (usually federally funded, often through provincial partnerships).

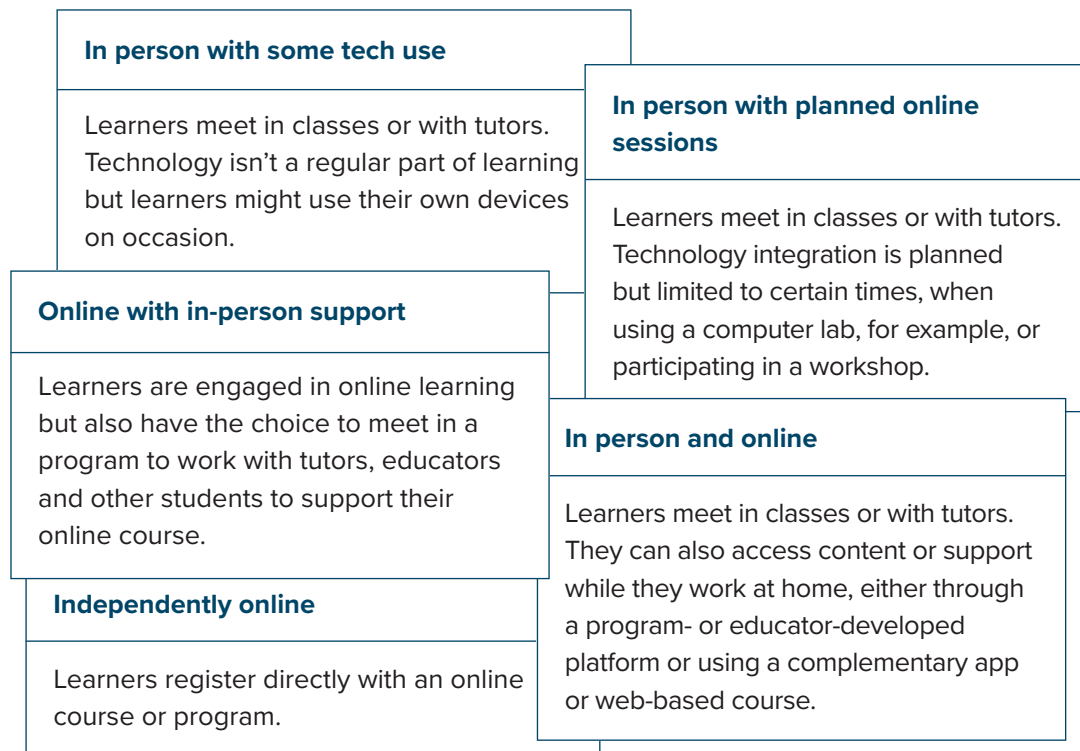
The delivery of digital literacy learning depends on available infrastructure and internet access, for both learners and educators. As a result, various delivery modes have emerged, from in-person courses, small learning groups and tutoring sessions with some use of technology to fully independent online programs — and no one size fits all (see figure 3). We have chosen to illustrate delivery modes as overlapping layers and not, as is often done, on a continuum to reflect the adaptable nature of digital literacy learning.

Digital delivery can be adaptable when learners attend in-person programs, even when they use technology as a planned and integrated part of their curriculum in computer labs and their classes. If learners have a reliable connection and up-to-date devices at home, delivery can expand beyond the confines of a program, allowing them to keep learning at home, which is ideal for adults with multiple commitments, including sole responsibility for child care and family care or transportation challenges. For learners taking online courses, some programs provide in-person support to troubleshoot, navigate, organize, compose and submit assignments. This is especially useful for those new to online learning, such as older adults, and also appeals to learners who need a space outside the home to focus and establish a routine, which can be challenging in a busy home environment. Another option is exclusively online learning, with no in-person interaction, in which adult learners can complete all courses and, in many cases, connect directly online with course facilitators, teachers and fellow students.

One strength of adult education programs is their variety and adaptation to infrastructure conditions, given the importance of flexible delivery for digitally excluded adults. However, the shift to online learning can be difficult, which means that low-technology solutions and personalized learning supports are highly relevant, especially for low-income learners without sufficient language or literacy skills. Not having a reliable and affordable internet connection and suitable devices at home further dilutes the benefits of adult digital learning programs by making it more difficult to participate in blended and online learning, as happened during the pandemic, and limiting the new knowledge that learners can transfer to their everyday lives.

In addition to considering modes of delivery, educators and program co-ordinators must make decisions on curriculum and pedagogical approaches. Digital learning pedagogy could be co-ordinated with the mode and prescribed content, especially when taking online courses that lead to a credential such as a secondary credit, a college bridging course or a workplace certification. Alternatively, it could be co-ordinated with each learner's interests and goals. Often, the best approach may be a mixture of prescribed, adapted and uniquely created content.

Figure 3. Delivery modes for digital literacy learning



In hybrid or blended learning scenarios, which have become more popular since the pandemic, educators and trainers assemble, develop and modify content for use online and in person. They nurture learning-teaching relationships, deploy various learning strategies and adapt content for both online and in-person delivery. Depending on the provider, much of this work can be done without the support of an IT department or teaching centre.

Educators often supplement existing content with digital learning for in-person delivery, using various online resources and educational technology sites. There are no off-the-shelf solutions for working with adults with different academic backgrounds, aims and interests, and with varying degrees of expertise with technology, language and literacy. Educators often develop their digital learning materials to meet the specific language and literacy needs of the communities they work with. These materials typically focus on digital functions and computer basics, online security, responsible behaviours and critical evaluation of information.

Barriers to reaching the adult education system's potential

The adult education system offers unique benefits for digital literacy development. It has a presence in communities across Canada, and it recognizes the limitations of one-size-fits-all learning in the context of varying socio-economic conditions. Nevertheless, the full potential of adult education has yet to be realized. Previous research, such as Walker (2022), discusses the main barriers adult education faces, including marginalization

and lack of recognition of learners and educators, and the dearth of co-ordination and collaboration among providers across Canada. We zoom in below on additional obstacles that adult education programs face in the field of digital learning.

A highly siloed field with multiple funders

Funding and delivery mechanisms for Canada's adult learning and skills development programs tend to be a complex patchwork of funders and providers, each with its own funding, accountability requirements and reporting systems, resulting in administrative redundancies. Adult education programs receive funding from provincial and federal governments, often with more than one provincial ministry involved. The federal government may earmark project funding specifically for digital learning and employment training initiatives that involve digital literacy development.

Navigating this landscape creates an additional burden as programs must shift resources away from teaching and learning toward applications, mandated reporting and program evaluation processes. Digital learning programs also compound pressure on already stretched resources with extra demands for data collection, assessment and accountability. A single large provider working with adult learners may need four or five separate systems to track learners and comply with various data collection, testing and reporting demands, as well as financial audit processes required by each funder and the provider. A learner moving from one program to another could be tracked in more than one system. All this tracking takes up scant resources and shifts priorities away from instruction and learner support. In a recent survey of adult education providers in Ontario, 328 respondents indicated they spend over half their time on accountability requirements rather than instruction up to a high school level (Teeny Big, 2024).⁵

The fragmentation of funding sources also leads to program silos and an array of services and programs that can be difficult for adult learners to navigate. The digital learning aspect adds another layer of complexity when prospective students attempt to find and access courses that best meet their needs. Digital learning may be embedded in an existing program or offered as a stand-alone course or workshop. To make matters worse, libraries and community agencies offering digital programs operate separately from other adult education providers. Each is often unfamiliar with the others' services even though they likely cater to the same pool of learners.

Lack of sustainable core funding and reliance on short-term, project-based funding

One of the most frustrating challenges adult education programs face in providing digital skills training is access to up-to-date computers connected to the internet and equipped with cameras, microphones and suitable software. The availability — or otherwise — of this equipment plays a huge role in determining the quality of digital literacy education. Yet adult education programs' current funding options do not cover the acquisition and maintenance of costly equipment and software.

⁵ Available on request from AlphaPlus.

While funding for many aspects of adult education is available year after year, it isn't core funding, and its requirements can be frustrating and perplexing. In Ontario, for example, literacy programs must apply for funding every year. They must make a case each time for continued funding and comply with onerous reporting requirements despite few or no changes in their operations and no chance of changing the funding allocation. One of the results is that programs cannot accumulate surpluses to support long-term initiatives such as technology planning, educators remain on short-term contracts, and the system remains marginalized.

The last operational funding increase in Ontario basic skills programs, over seven years ago, came with a requirement to increase enrolment, which pushed up operational costs, particularly staffing. In response, programs often curtail their offerings to cover funding shortfalls. Digital learning is a frequent victim of such funding uncertainty as competing pressures lower its priority. This means that programs find themselves unable to commit to long-term plans to purchase new equipment, and struggle to afford ongoing expenses such as software licensing and IT support. Occasionally, an adult education program is the beneficiary of a windfall earmarked for the purchase of new equipment, but it cannot be used for long-term planning, co-ordination and maintenance.

While targeted funding for digital learning does exist, it tends to be short-term and project-based. A recent federal initiative, the Digital Literacy Exchange Program (DLEP), exemplifies the problem with short-term project-based funding. The DLEP, overseen by Innovation, Science and Economic Development Canada, was initiated in 2017 with two rounds of funding totalling approximately \$42 million. It is "aimed at teaching digital literacy skills to Canadians who face barriers to participating in the digital economy," in other words, the same adults who participate in provincial adult education programs (Innovation, Science and Economic Development Canada, 2023).

The funded projects can be quite small and local, a model that works well for adult education programs that operate in isolation. The smallest amount requested so far is \$6,000 (Innovation, Science and Economic Development Canada, 2022b). However, only not-for-profit organizations can apply. On the surface, it makes sense that the federal government should not supplement funding for school boards and colleges. But in the adult learning world, with its fluid provincial-federal boundaries, a provincially or federally funded language program in a not-for-profit setting would be eligible for funding, but the same program overseen by a college or school board would not.

The problem with project-based funding is its short-term nature and its focus on immediate outcomes, such as the number of participants and program completion rates. Many DLEP projects have used the funds to develop new programs, hire staff and reach new participants. But what happens once the funding ends? The projects will probably be unable to continue unless additional funding is secured to sustain them. A couple of DLEP projects have used a more sustainable approach: a train-the-trainer strategy that builds the capacity of trainers (librarians, in the examples we found) who then develop resources and conduct workshops. After the funding ends, the trained library staff can continue with the workshops using the newly developed resources that suit their clientele.

Another source of project-based funding is the Skills for Success Program (Employment and Social Development Canada), which recently came to the end of a substantial three-year funding increase. Annual funding quadrupled for large demonstration and pilot projects and the development of what is called the Skills for Success model, an instructional curriculum for adults deemed “under-represented” in the labour market. However, the funds were aimed at innovation and new projects rather than supporting or supplementing existing programs. Funding was also available for the development of curriculums based on the Skills for Success model, a distinct approach compared to adult education curriculums currently in use. Neither aim supported existing programs.

Precarious work and limited professional development

School board and college providers of adult education generally rely on part-time staff working on yearly contracts. Some instructors turn to Employment Insurance to bridge the gap between contracts in much the same way as seasonal workers. Non-profits in the community depend on volunteers, and many fundraise to supplement government funding. Across all adult literacy providers, nearly half of paid employees work part-time and on contract with few or no benefits (Canadian Literacy and Learning Network, 2013). Without comprehensive union representation and a collective membership voice, working conditions are precarious.

Unlike other education programs, such as language and secondary credit-granting courses, the adult literacy sector does not mandate professional qualifications. Yet, despite the absence of entry qualifications and the predominance of precarious work, literacy educators and tutors are generally well educated, and many have other types of teaching qualifications (Canadian Literacy and Learning Network, 2013).

On-the-job access to professional development is challenging and unequally distributed, which presents an added challenge for adult educators, given the fast-paced evolution of technology and the technical knowledge required to successfully teach, use and troubleshoot different applications. This is especially relevant as dedicated digital learning educators are in short supply, with most digital instruction in the hands of language, literacy or employment training educators. Adult educators, librarians and community workers have become the first point of support for learners with technology-related issues as individuals take on more responsibility for accessing services and benefits. Yet these educators have to do much of this work on their own time and outside of their regular duties, which means it is often not counted in official reporting.

Those working in the federally funded second-language training sector, Language Instruction for Newcomers to Canada (LINC) funded by the IRCC, have more consistent and comprehensive professional development opportunities, including digital learning. In contrast, educators working in other sectors can face greater challenges accessing professional learning opportunities, depending on the province or territory where they work. While adult language educators have nationally recognized credentials and can join professional associations and professional learning bodies, those working in adult literacy, employment training and adult secondary equivalency programs must make do without such support.

In addition to short-term project funding, the Skills for Success program has developed an instructional system for learners along with an extensive competency system for instructors. However, the model is oriented to an international adult skills test rather than provincial and territorial curriculums or instructional frameworks based on a variety of research-informed learning indicators. The model has not been analyzed to determine whether the instructional approach is more effective than other approaches, nor does it lead to recognized credentials and it is not aligned with other learning and assessment frameworks currently used in the adult learning system. While digital learning is one of nine targeted skills in the model, it is treated as a separate subject. Instructional guidance has the drawback of not integrating digital learning with the other skills, the context of language, literacy and job training programs, or the realities of adult learners' lives. Adult educators reference the frameworks mandated for use by other funders rather than Skills for Success. Without a clear purpose or rationale for using Skills for Success, it runs the risk of being yet another cumbersome accountability mechanism imposed on provincial and territorial programs that receive federal transfer payments for labour market training and skills development. The concern is that it takes even more time away from goal-oriented teaching and learning while introducing new barriers to learners.

In an environment where funding allocations do not keep up with rising operational costs, professional development is often considered a luxury that can easily be cut. Another challenge is paid or released time for professional development in an environment already overburdened by administrative tasks. In most cases, educators are expected to do much of their professional development on their own time.

The Canadian Adult Education Credential (CAEC), an online secondary equivalency test, which recently replaced the widely recognized General Educational Development (GED) test, exemplifies many of the challenges we identified.⁶ The move to an online test, along with a new emphasis on reading and writing in digital environments, introduces learning and access challenges that adult education programs are well suited to address. However, there is no dedicated funding or national collaboration for curriculum, instructional knowledge exchange and professional development.

POLICY INTERVENTIONS TO BRIDGE THE DIGITAL DIVIDE VIA ADULT EDUCATION

To be truly effective, public policy aiming to bridge the digital divide must place formal digital learning opportunities at the forefront. Moreover, we must consider digital learning as part of the overall system of adult education. Once it is inextricably integrated into various programs and curriculums, digital learning would greatly benefit from other measures that aim to support and promote adult education, such as bringing it into the mainstream, professionalizing adult educators, empowering Indigenous leadership, building toward national co-ordination and using recognized measures of progress (Walker, 2022).

⁶ For more information on the Canadian Adult Education Credentials, see <https://www.alberta.ca/canadian-adult-education-credential>.

For the time being, however, as we have seen in the previous section, digital learning just adds another layer of complexity for policymakers to consider. To address these barriers and support service providers, we propose the following:

Ensure the provision of sustained core funding

Provincially controlled programs need core funding to stabilize their operations, make long-term plans and reduce redundancies. Many programs must currently reapply for operational financing each year. Core funding, with appropriate accountability measures, would remove administrative inefficiencies. It would also encourage programs to draw up long-term plans, carry over surpluses and build reserves that could be used for valuable major investments. We have identified three main areas of adult education that require sustained funding:

■ Equipment acquisition, IT support and software licensing

Funding options for adult education programs must make provision for the acquisition of up-to-date hardware, such as computers and peripherals, as well as software. Unlike the windfall funds discussed above, this funding must be predictable year in and year out to allow for long-term planning, especially for community-based non-profit providers that do not have their own IT departments. In a less competitive and more collaborative funding environment, the internal resources of school boards and community colleges could help support community-based providers, creating multiple pathways that are easier to navigate for adult learners.

Currently, adult education providers have varying levels of IT support and access to group pricing for software licensing and educational technology subscriptions. At one end of the spectrum are institutions, such as colleges, that give adult education programs generous access to their existing IT facilities, institutional pricing arrangements and even professional learning. On the other hand, small not-for-profit organizations in the community, with two or three staff members, must negotiate and budget their own IT support. They are unable to pool their needs to gain access to more competitive pricing, and must generally suffer the inefficiencies and other drawbacks of working in isolation.

Funding of technology-related costs must cover recurring expenses for computer hardware and software, IT support and licensing or subscription fees. Without these items, one-time investments become essentially useless. Yet recurring costs often cannot be covered with windfall funds or included in already-existing operational expenses. As discussed above, core funding is hard to secure, especially when technology maintenance costs inflate operational expenses. A federally funded mechanism could facilitate this process in the short and long term by encouraging adult education providers in the provinces to work together even as they compete for funded clients. We suggest federal involvement since provinces do not currently provide such a mechanism. Such a model would encourage community-based non-profit programs to pool funds and bundle resources, enabling them to become more competitive and resilient. Funding could be allocated to existing provincial support programs such as the Community Adult Learning Program (CALP) in Alberta, Decoda in British Columbia or dedicated digital support organizations like those in Ontario.

■ **A mechanism to share learning materials, curriculums and best practices nationally**

Creating interactive, engaging and visual digital content is expensive and beyond the reach of most adult secondary and literacy programs. Project funding can help make a long-term impact by supporting the development of such materials.

The benefits of project funding could be significantly greater if such learning materials made their way into the adult education field at large. Shared with other digital literacy providers, these materials would help educators and adult learners. Digital learning materials could be disseminated through a unified pan-Canadian platform or repository that should be established and managed federally. Hayes (2024) has advocated for the revival of Canada's literacy database, Copian (formerly known as the National Adult Literacy Database), or a similar initiative, emphasizing the enhanced efficiency and effectiveness that can be achieved through federal oversight. Centralizing these efforts could streamline access and utilization of educational resources across the country.⁷

This recommendation is reinforced by a recent review of the DLEP, which proposed that Innovation, Science and Economic Development Canada's (ISED) Connected Canada Branch should “explore opportunities to share some of the digital literacy resources that have been created through the DLEP to allow partners to leverage these resources” (Innovation, Science and Economic Development Canada, 2022b). We argue that such an online platform would make these materials freely available to a broader audience of educators and trainers.⁸

The Skills for Success website presents information on federally funded projects, including those involving digital skills. The website does not, however, include materials such as curriculums that have been developed by these projects. There is also a repository of training and assessment materials developed using the Skills for Success funding.⁹ However, this is strictly limited to materials that use the Skills for Success model and does not include materials from other publicly funded programs. Some of the items comprise only general information (for example, Computer Comfort), come with license fees, and do not address the need for a national repository.¹⁰

■ **Ongoing professional development of adult educators**

Given the crucial role adult educators play in digital learning, they must be equipped with the knowledge, skills and resources to design and deliver relevant, engaging and inclusive digital literacy training. The fast-changing nature of digital technologies warrants ongoing professional development for adult educators so that they can update their digital skills, reflect on their practices and collaborate with other professionals in the field

⁷ Copian has been managed by Co-Savoir, formerly CDEACF, since 2015. <https://cdeacf.ca/copian>.

⁸ While learning materials developed by DLEP-funded projects can be located by searching funding recipients' websites, we identified only two recipients who made them available without fees or accounts.

⁹ <https://sfs-tools.ca/digital-resource-library/>.

¹⁰ <https://www.canada.ca/en/services/jobs/training/initiatives/skills-success/tools.html>.

to deliver digital literacy training that meets the diverse needs and goals of their learners. We recommend developing a professional qualification and development program with specialization options (for example, digital literacy). The existing LINC programs provide a working model for recognizing credentialing and investing in professionalization of adult educators.

Another powerful way of giving adult educators valuable opportunities for continuous improvement is to create a “community of practice.” This peer-learning mechanism facilitates knowledge exchange and collaboration by sharing resources, best practices and research.

The review of the DLEP mentioned above states that “ISED should also explore opportunities for DLEP recipients to connect to share promising practices and lessons learned” (Innovation, Science and Economic Development Canada, 2022b). In its response to this recommendation, the management of the Spectrum and Telecommunications Sector at ISED stated that the Connected Canada Branch would “consider a variety of options to allow funding recipients to collaborate and share best practices and program resources, including the development of a community of practice amongst funding recipients, which will allow ongoing development and discussion amongst funding recipients and enable them to co-develop and share best practices” (Innovation, Science and Economic Development Canada, 2022b). We argue that this sharing mechanism should be extended to all service providers.

Our experience in provincial, national and international settings has exposed us to programs that support digital teaching and learning and could serve as models for such a sharing platform. In Ontario, for instance, AlphaPlus¹¹ provides digital technology resources and training for local service providers to build capacity for equitable access to literacy learning. The federal LINC program offers teacher training for blended and online courses through a learning management system with Canadian second-language training content (Avenue.ca.) and a repository for sharing curriculum and training resources (Tutela.ca).¹²

Connect adult education and informal learning at the community level

A 2022 report by the Ryerson Leadership Lab, Brookfield Institute for Innovation and Entrepreneurship, First Nations Technology Council and SFU Public Square calls for the creation of a cross-sectoral network of public, private and community organizations to co-ordinate initiatives focused on enhancing digital literacy and providing access to devices and software for underserved and vulnerable communities and individuals (Abdelaal & Andrey, 2022).

We fully support this recommendation and argue that programs in the adult learning and skills development system could play a key role in such a network, given the professional expertise of program providers and their connections with learners from various communities.

¹¹ AlphaPlus: alphaplus.ca.

¹² Avenue: avenue.ca, LearnIT2teach: learnit2teach.ca, Tutela: tutela.ca.

Located in rural, remote and urban areas across the country, adult learning programs can act as learning hubs. Many already have links with social services and employment agencies, as well as partnerships with libraries, which have begun to examine their post-pandemic roles, including the need for new and different partnerships with community groups and education providers (Rosales, 2021).

With a partnership model that encourages collaboration, programs could build pathways between libraries, adult language, literacy and secondary learning centres, and community agencies. One possible mechanism is a digital navigator model that employs “trusted guides who assist community members in internet adoption and the use of computing devices” (National Digital Inclusion Alliance, n.d.). These guides provide personalized supports in response to specific needs, often involving access to services and fulfilling institutional form-filling and compliance demands — from signing, scanning and returning a permission form for a school field trip to completing a police record check for volunteers or filing a tax form to ensure access to benefits (National Digital Inclusion Alliance, n.d.). Trained librarians and community workers might recognize additional language and literacy challenges and make a referral to a local adult learning program. This sort of on-demand support not only bridges informal and formal learning but guides and structures informal learning to help integrate adults into the world of modern technology.

OUR RECOMMENDATIONS

If we are to bridge the digital divide that currently splits our society, we need to acknowledge and address three key issues:

- Affordable, seamless and on-demand access for all.
- Sustained learning opportunities.
- Every citizen’s right to the benefits that flow from equitable access.

A comprehensive strategy for digital learning and online engagement must value and support provincial and territorial adult education programs. Excluding these programs from the discussion is a missed opportunity to apply their holistic approach to digital learning and inclusion.

Publicly funded agencies, community organizations and libraries where adults can seek digital support do not necessarily have a mandate to teach. Although they may offer some digital learning opportunities, they usually rely on short-term project funding. Adult learning centres in each province and territory have a mandate to teach, but most have stagnant annual budgets. These gaps limit the potential for a comprehensive and co-ordinated drive to broaden digital inclusion.

Existing federal funding for digital learning for marginalized adults in Canada is ad hoc, short-term and limited. Without direct, sustained core funding, there is little incentive to develop more effective instruction focused on learning new digitally mediated language, literacy and numeracy practices, and to apply those accomplishments to projects that open new horizons for learning, employment and community initiatives. Whether administered

provincially or nationally, short-term project funding can perpetuate digital exclusion and the serious disadvantages that entails. Among them: innovations in digital delivery modes and pedagogies cannot be sustained; previously developed content is not shared; a do-it-yourself approach focused on computer basics dominates; and co-ordination is lacking with provincial adult learning and skills development systems.

Various measures aimed at bringing adult education programs into the mainstream may become a tide that lifts all boats. But some boats are likely to need an extra lift. We propose two measures that would help adult education programs overcome the complexities created by adding digital learning to their offerings. Employment and Social Development Canada should work with provinces and territories to:

1. **Ensure the provision of sustained core funding to provincial and territorial adult education programs.** This funding would stabilize operations, facilitate long-term planning and reduce administrative redundancies, particularly by ensuring predictable support for equipment acquisition, IT infrastructure and software licensing. Additionally, we urge the creation of a national platform to share learning materials and best practices among educators.
2. **Connect community-level adult education with broader digital literacy efforts.** We foresee tangible and long-lasting benefits from the creation of a cross-sectoral network to co-ordinate programs aimed at enhancing digital skills and access for underserved communities. By building on existing partnerships and establishing new collaborations, such initiatives can serve as vital hubs for integrating informal and formal learning, thereby ensuring equitable access to digital resources across diverse Canadian communities.

This is a pivotal moment. During the pandemic, we saw the digital divide for what it was — a complex issue that cannot be solved by ramping up technological solutions without considering underlying social inequalities of digital access and their harmful impact on every facet of our lives. To bridge the gap, we need a comprehensive, co-ordinated and sustainable approach to keep up with the relentless pace of technological change.

REFERENCES

- @NS. (n.d.). About @NS. <https://www.communitytechns.ca/about>
- Abdelaal, N., & Andrey, A. (2022). *Overcoming digital divides: What we heard and recommendations*. Toronto Metropolitan University. <https://dais.ca/reports/overcoming-digital-divides/>
- Canadian Internet Registration Authority. (2018). *The gap between us: Perspectives on building a better online Canada*. <https://www.cira.ca/en/resources/documents/state-of-internet/gap-between-us-perspectives-building-a-better-online-canada/>
- Canadian Internet Registration Authority. (2021). *Unconnected: Funding shortfalls, policy imbalances and how they are contributing to Canada's digital underdevelopment*.
- Canadian Literacy and Learning Network. (2013). *The realities of working in the literacy and essential skills field: An occupational profile of Canada's literacy and essential skills workforce*. http://en.copian.ca/library/research/clln/realities_working_lit_es_field/realities_working_lit_es_field.pdf
- Canadian Radio-television and Telecommunications Commission. (n.d.). *Current trends – High-speed broadband*. <https://crtc.gc.ca/eng/publications/reports/PolicyMonitoring/ban.htm>
- Canadian Radio-television and Telecommunications Commission. (2020). *Communications monitoring report 2019*. Government of Canada. <https://crtc.gc.ca/pubs/cmr2019-en.pdf>
- Council of Ministers of Education, Canada. (2012). *Adult learning and education: Canada progress report for the UNESCO global report on adult learning and education (GRALE) and the end of the United Nations Literacy Decade*. https://www.cmec.ca/Publications/Lists/Publications/Attachments/283/GRALE_EN.pdf
- Cukier, W., Elmi, M., Munro, D., & Sultana, A. (2020). *Skills for the post-pandemic world: Scoping report*. Public Policy Forum. <https://ppforum.ca/publications/skills-for-the-post-pandemic-world-scoping-report/>
- Geist, M. (2012, April 18). *Cutting community internet access program highlights absence of digital strategy*. <https://www.michaelgeist.ca/2012/04/cap-cut-column-2/>
- Green, A., Green, G., & Pensiero, N. (2015). Cross-country variation in adult skills inequality: Why are skill levels and opportunities so unequal in anglophone countries? *Comparative Education Review* (59)4, 595-618. <https://doi.org/10.1086/683101>
- Green, D. A., & Riddell, C. W. (2007). *Literacy and the labour market: The generation of literacy and its impact on earnings for native born Canadians*. Statistics Canada. <https://www150.statcan.gc.ca/n1/pub/89-552-m/89-552-m2007018-eng.htm>
- Grotlüschen, A., Buddeberg, K., Dutz, G., Heilmann, L., & Stammer, C. (2021). LEO 2018 – Living with low literacy. In A. Grotlüschen & L. Heilmann (Eds.), *Between PIAAC and the new literacy studies: What adult education can learn from large-scale assessments without adopting the neo-liberal paradigm* (pp. 213-244). Waxmann. <https://www.waxmann.com/index.php?eID=download&buchnr=4188>
- Haight, M., Quan-Hasse, A., & Corbett, B. (2014). Revisiting the digital divide in Canada: The impact of demographic factors on access to the internet, level of online activity, and social networking site usage. *Information, Communication & Society*, 17(4), 503-519. <https://doi.org/10.1080/1369118X.2014.891633>

- Hayes, B. (2024). *Let's rebuild the foundation: Reinstating Canada's adult literacy knowledge infrastructure requires federal leadership*. IRPP Insight No. 53. Montreal: Institute for Research on Public Policy. <https://irpp.org/research-studies/reinstating-canada-adult-literacy-knowledge-infrastructure/>
- Heisz, A., Notten, G., & Situ, J. (2016). *The association between skills and low income*. Statistics Canada. <https://www150.statcan.gc.ca/n1/en/pub/75-006-x/2016001/article/14322-eng.pdf?st=veLotBv4>
- Huynh, A., & Malli, N. (2018). *Levelling up: The quest for digital literacy*. Brookfield Institute. <https://dais.ca/reports/levelling-up/>
- Innovation, Science and Economic Development Canada. (2009). *Final evaluation of the Community Access Program (CAP)*. <https://ised-isde.canada.ca/site/audits-evaluations/en/evaluation-reports/final-evaluation-community-access-program-cap>
- Innovation, Science and Economic Development Canada. (2022a). *Connecting Families Initiative*. <https://ised-isde.canada.ca/site/connecting-families/en>
- Innovation, Science and Economic Development Canada. (2022b). *Evaluation of the Digital Literacy Exchange Program*. https://publications.gc.ca/collections/collection_2022/ised-ised/iu4/lu4-411-2022-2-eng.pdf
- Innovation, Science and Economic Development Canada. (2023). *Digital Literacy Exchange Program*. <https://ised-isde.canada.ca/site/digital-literacy-exchange-program/en>
- International Telecommunications Union. (n.d.). *ICT Development Index 2017*. <https://www.itu.int/net4/ITU-D/idi/2017/index.html>
- Johnson, E., & Uda, E. (2020, May 9). Telco customer sees internet bill more than triple during pandemic — and she's not alone. *CBC News*. <https://www.cbc.ca/news/business/rural-telco-customers-internet-costs-increase-1.5561755>
- Kupfer, M. (2016, December 21). CRTC declares broadband internet access a basic service. *CBC News*. <https://www.cbc.ca/news/politics/crtc-internet-essential-service-1.3906664>
- Ministry of Advanced Education and Skills Development. (2017). *Strengthening Ontario's adult education system*. Government of Ontario. <https://files.ontario.ca/adult-education-system-dec2017-en.pdf>
- Munro, D. (2019, March). *Skills, training and lifelong learning*. Public Policy Forum. <https://ppforum.ca/wp-content/uploads/2019/03/SkillsTrainingAndLifelongLearning-PPF-MARCH2019-EN.pdf>
- National Digital Inclusion Alliance. (n.d.). *The digital navigator model*. <https://www.digitalinclusion.org/digital-navigator-model/>
- Organization for Economic Co-operation and Development. (2012). *Literacy, numeracy and problem solving in technology-rich environments: Framework for the OECD survey of adult skills*. OECD. https://www.oecd-ilibrary.org/education/literacy-numeracy-and-problem-solving-in-technology-rich-environments_9789264128859-en
- Pinsent-Johnson, C., & Sturm, M. (2020). *The impact of Ontario's digital divide*. AlphaPlus. <https://alphaplus.ca/resources/the-impact-of-ontarios-digital-divide/>
- Rosales, N. (2021). Public library responses to COVID-19: An investigation and reflection of Canadian experiences. *Emerging Library & Information Perspectives*, 4(1), 169-185. <https://doi.org/10.5206/elip.v4i1.13852>

- Sharkey, J. (2015, October 8). Wi-Fi hotspot loans from Kitchener, Ont. library, a Canadian first. *CBC News*. <https://www.cbc.ca/news/canada/kitchener-waterloo/kitchener-library-lends-portable-wifi-1.3258791>
- Shortt, D., Robson, B., & Sabat, M. (2020). *Bridging the digital skills gap*. Public Policy Forum. <https://www.torontomu.ca/diversity/reports/Digital-Skills-Alternative-Pathways.pdf>
- Silver, J. (2022). *Adult education in Manitoba: Unearth this buried treasure*. Canadian Centre for Policy Alternatives. <https://policyalternatives.ca/sites/default/files/uploads/publications/Manitoba%20Office/2022/01/Adult%20Education-Unearth-this-buried-treasure.pdf>
- Statistics Canada (2020, January 23). *Programme for the International Assessment of Adult Competencies (PIAAC)*. <https://www23.statcan.gc.ca/imdb/p2SV.pl?Function=getSurvey&SDDS=4406>
- Statistics Canada. (2013). *Skills in Canada: First results from the Programme for the International Assessment of Adult Competencies (PIAAC)*. Government of Canada. <https://www150.statcan.gc.ca/n1/en/catalogue/89-555-X2013001>
- Teeny Big (2024). *AlphaPlus strategy research findings*. Unpublished report, available on request from AlphaPlus.
- Toronto Public Library. (2020). *Meaningful access: How Bridge helps reposition the public library as a crucial technology enabler*.
- van Deursen, A. & van Dijk, J. (2013). The digital divide shifts to differences in usage. *New Media and Society* 16(3), 507-526. <https://doi.org/10.1177/1461444813487959>
- Walker, J. (2022). Poor Cousin No More: Lessons for Adult Education in Canada from the Past and New Zealand. *IRPP Insight* No. 43. Montreal: Institute for Research on Public Policy. <https://irpp.org/research-studies/poor-cousin-no-more-lessons-for-adult-education-in-canada-from-the-past-and-new-zealand/>
- Wells, N. (2020, August 3). COVID 19 Alert app faces accessibility criticism for older Canadians, marginalized groups. *Global News*. <https://globalnews.ca/news/7247362/covid-19-alert-app-accessibility-criticism/>
- Xenogiani, T. (2017, May 31). *Why are immigrants less proficient in literacy than native-born adults?* OECD Education and Skills Today. <https://oecdeditoday.com/why-are-immigrants-less-proficient-in-literacy-than-native-born-adults/>



INSTITUT
DE RECHERCHE
EN POLITIQUES
PUBLIQUES

INSTITUTE
FOR RESEARCH
ON PUBLIC
POLICY

The IRPP seeks to improve public policy in Canada by generating research, providing insight and influencing debate on current and emerging policy issues facing Canadians and their governments.

L'IRPP contribue à l'amélioration des politiques publiques en produisant des recherches et des analyses approfondies qui éclairent le débat sur les grands enjeux auxquels sont confrontés les Canadiens et leurs gouvernements.

Copyright belongs to the IRPP.
To order or request permission to reprint, contact:

IRPP
1470 Peel Street, Suite 200
Montreal, Quebec H3A 1T1
Telephone: 514-985-2461
Fax: 514-985-2559
irpp@irpp.org