EST. 1899
United for Literacy
Littératie Ensemble

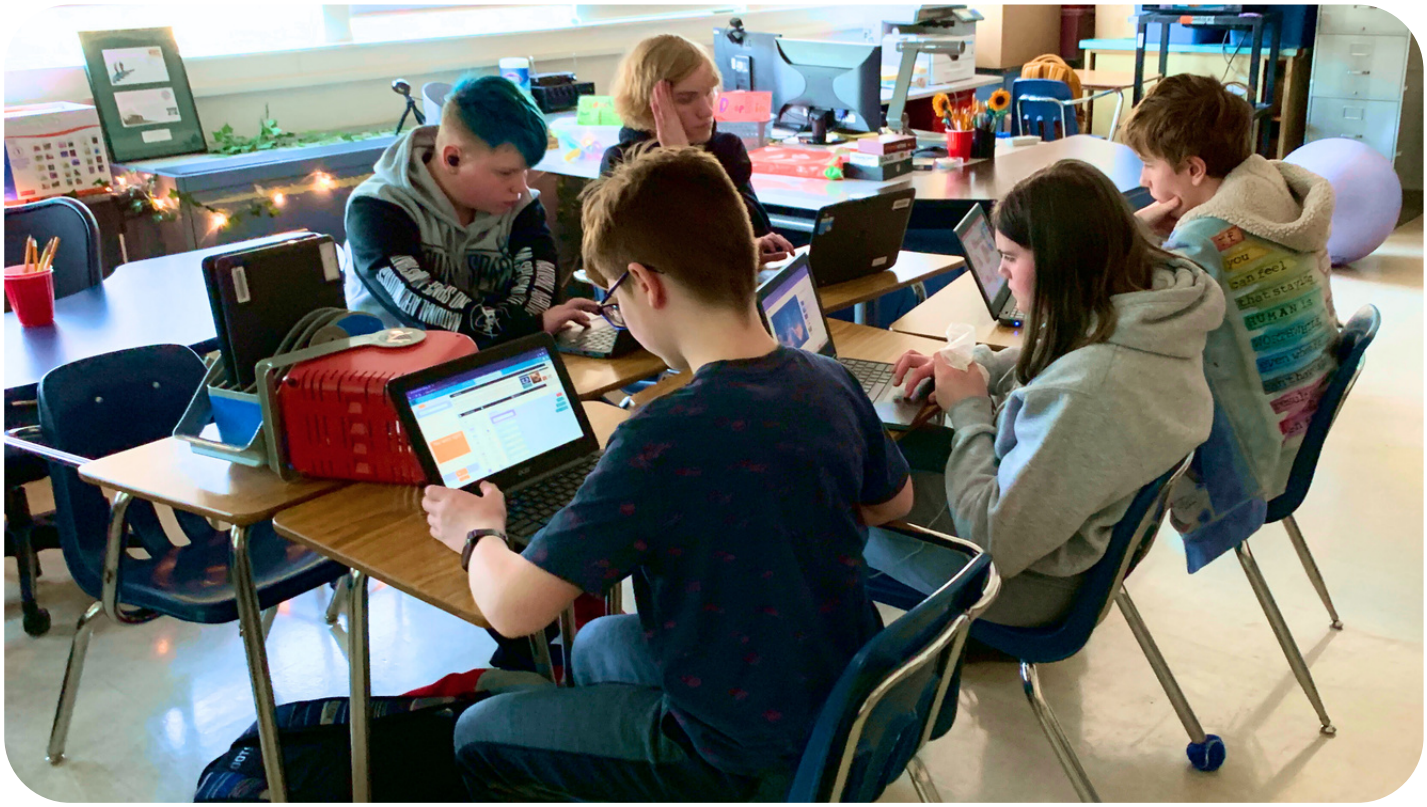
THE ARTIFICIAL INTELLIGENCE REVOLUTION AND LITERACY:

Opportunity or Threat?

DISCUSSION PAPER – 2023

About United for Literacy

At United for Literacy, we believe that literacy is a right. Literacy and numeracy touch every aspect of our lives. The ability to read, write, and do math has a profound influence on our well-being. Yet people of all ages face barriers to improving their literacy and numeracy skills. Since 1899, United for Literacy has been Canada's premier literacy organization. We work with volunteers and community partners to deliver reading, writing, and math support to children, youth, and adults. Over the 2022-2023 program year, our programs supported more than 33,000 people in over 500 communities.



Introduction: AI and Literacy

In 2022, OpenAI launched its chatbot ChatGPT (Chat Generative Pre-Trained Transformer). ChatGPT garnered a lot of excitement. For the first time, a chatbot could generate "human-like" written text. It also opened concerns surrounding privacy, data bias, and Artificial Intelligence (AI) generally. But while ChatGPT came out in 2022, AI itself is not new. Research from 2019 reveals that while only 33% of people believe they use AI, up to 77% are actually using it.[1] **Every time you use an email account with an embedded spam filter, unlock your phone using facial recognition, or order a ride through an app like Uber or Lyft, you are using AI.**

What is AI? AI is any software that can simulate human-like thinking.[2] AI computer systems can perform tasks that, historically, only humans could perform. These tasks include problem-solving, decision-making, and reasoning.[3] The AI built into your email, for example, "reads" everything you type and predicts what you'll write next to offer textual suggestions.

AI is already prolific in our daily lives, yet many questions remain. For example:

- How can we use AI effectively and ethically?
- What basic skills—like reading, writing, and math—do we need to use AI in a meaningful way?
- Can AI help to eliminate education inequities, or will it deepen the divide?
- Can it be used to advocate for equity, diversity, and inclusion in our increasingly polarized world?

With over a century of experience in literacy, United for Literacy will host a National Forum on Literacy and AI to begin to explore some of these complex questions. We will turn a critical eye to AI while also being mindful of the possibilities it represents.

We recommend governments, community organizations, employers, and researchers explore the relationship between literacy and AI to identify how AI can be used ethically to reduce literacy inequities and create meaningful controls on the use of AI in education.

"AI technologies have a wide range of applications across industries, including healthcare, finance, transportation, manufacturing, and entertainment. They can automate tasks, improve efficiency, provide personalized recommendations, analyze vast amounts of data, and assist in decision-making processes. However, it's important to consider ethical and societal implications as AI continues to advance."
– ChatGPT generated text [4]

Digital Inequality

At United for Literacy, our work has shown that literacy is more than the ability to read and write. Having strong literacy skills means having the power to tell your own story and engage with the stories of others. Moreover, studies have shown that literacy is a powerful predictor of life success. Low literacy skills and the experience of poverty are intrinsically linked.[5] Literacy upgrading has positive impacts on job performance, increased employment, higher earnings, and job retention.[6]

Strong literacy skills help people:

- complete high school,
- consider further education in subjects that interest them,
- create long- and short-term career goals,
- engage in lifelong learning opportunities, and
- make informed decisions about finances, housing, health, and other determinants of well-being.

Digital literacy refers to the ability to understand and use various forms of technology. Since technology is a part of daily life, digital literacy is important to people in Canada. Digital technology builds on and intersects with traditional literacy. It allows people to use technology to engage with each other, tell stories, and seize opportunities at work and in the community. But not all Canadians have the same access to digital literacy tools. The **digital divide** is the inequality between people who have high levels of digital literacy and those who do not. This creates a rift in access between communities. The Canadian government plans to combat the impacts of the digital divide. This includes ensuring 98% of people have access to high-speed internet by 2026, with 100% being the target for 2030.[7] As of 2018, the government estimated that 99% of households had internet access, but the speed and quality of connection were not noted.[8]

The digital divide and digital inequality are associated with three key elements:

- access to technology,
- levels of digital literacy, and
- structural barriers to obtaining digital literacy.

For example, for a child to have a higher level of digital literacy, this child should:

- have access to a laptop,
- have a tutor to help them navigate the online portal used by their school, and
- have access to free or low-cost coding classes.

These combined factors ensure there are no barriers to digital access. To better visualize the issue, compare this with a child who uses a library computer and does not have access to additional resources.

Canadian students report higher levels of digital literacy than the international average.[9]
Generally, Canadian students can:

- identify misinformation in digital sources,
- identify bias in digital sources, and
- understand the consequences of posting public information.[10]

Canadian learners have the skills and ability to succeed in online learning environments.[11] Educators who foster this potential help empower students to reach their goals. Studies have determined that it is not only important for students to be able to use AI but also to understand the ethics around it.[12] Developing strong digital and foundational literacy can help Canadian children, youth, and adults better understand AI and evaluate its impact.

Why does digital literacy matter when it comes to AI and addressing digital inequality?

Over the last 20 years, digital technologies have become part of everyday life.[13] There is still much to learn about how AI will impact the digital divide. What we do know is that this transition to a more technological world means that digital literacy is important for many daily activities, such as:

- engaging in social networks,
- communicating with others,
- staying up to date on current events,
- participating in educational settings,
- consulting a health professional, and
- obtaining and maintaining employment.

As AI becomes more and more common in schools and in the workplace, Canadians must develop strong digital literacy skills to keep up with academic and career demands.[14] The Canadian government has introduced **Bill C-27** to address concerns related to privacy and AI, but as it has not yet passed, these issues remain prevalent in schools and workplaces.[15]

What is Bill C-27? Bill C-27, or the Digital Charter Implementation Act 2022, "contains three proposed Acts, which relate to consumer privacy, data protection, and AI systems."[16] It is the Canadian federal government's first attempt to regulate artificial intelligence.

Many AI programs come with algorithmic bias. Thus, governments, school boards, non-profits, and private companies are currently working on the frameworks for using AI ethically. Some overarching considerations, especially in the context of digital literacy and learning, include:

- **Algorithmic Biases:** In schools, AI can automate assessments and invigilate exams. However, these tools cannot always account for gendered language or the work of someone writing in a second language. This results in bias. In the workplace, AI programs can screen[17] candidates to speed up the hiring process. However, AI often discriminates against those with disabilities.[18] These biases may mean that people face social and digital inequality in school and at work. Communities with lower levels of digital literacy, which often also have higher poverty rates, will struggle if they are overlooked by AI programs in school or work.

- **Privacy and Security:** AI-based programs contain a lot of private information. Data breaches could expose a student's progress, behaviour, and personal data to the world.[19] It's crucial that people understand where information used by AI is stored and how it is used to understand behaviours, preferences, and personalities.

- **Technology Dependence:** AI-based programs rely on access to phones, computers, and other technology. Using AI could increase technological dependence and potentially decrease critical-thinking and problem-solving abilities of students.[20]

We know that literacy is an important factor in life success, but what are the threats and opportunities brought on by AI to low literacy learners? How can non-profits and equity-seeking groups use AI to advocate for equity, diversity, and inclusion?

As the conversation around AI continues to unfold, consider the following:

- How many people across Canada have the skills they need to use AI—and the internet more broadly—effectively and ethically?
- How many people across Canada have a high level of digital literacy? Where do they live? How have they acquired this high level of digital literacy?
- What is the intersection of digital literacy and traditional literacy?

Digital Learning

AI can be a powerful tool in the workplace. The Organization for Economic Cooperation and Development (OECD) predicts that by 2026 AI will be able to solve all literacy and numeracy tests designed to assess adult skill-levels.[21] An OECD report suggests that a large portion of the workforce uses literacy and numeracy skills at work. The proficiency may vary—it may be at par with or lower than that of computers. This adds pressure on the education systems to strengthen the foundational skills of students and workers and teach them how to work with AI. Higher literacy levels will enable people to adapt to potential technology-driven changes. It would also enable mobility between occupations since diverse skills apply in different work contexts.

Education systems need to keep up with the advances in AI by improving the foundational literacy and numeracy skills of the future workforce. Moreover, education systems strengthen students' digital skills to help them develop strong, diverse skill sets.

> "Similar to classic literacy, which includes reading/writing and mathematical abilities, AI literacy has emerged as a new skill set in response to this new era of intelligence."
> - Davy Tsz Kit Ng , The University of Hong Kong [22]

We have seen how AI can have a positive impact on the workplace—but what about school?

Can AI be used to enhance education? UNESCO reports that a recent global survey found that fewer than 10% of schools have formal policies or guidelines on how to use AI technologies.[23] This lack of guidance makes it challenging for educators to treat the question of AI effectively and ethically in the classroom.

> Around the world, virtually no research has been undertaken, no guidelines have been agreed, no policies have been developed, and no regulations have been enacted to address the specific ethical issues raised by the use of artificial intelligence in education.
> - Fengchun Miao et al., UNESCO.

Since the onset of the COVID-19 pandemic, many of us have seen firsthand how technology can impact education—for better or worse. While AI can help teachers and educators automate paperwork and administrative tasks—freeing up more time to engage with learners—it also poses some challenges. Below are a few ways AI might impact the classroom, as identified by UNESCO in a 2021 report:

1) Education management or delivery:

- AI can automate administrative tasks, helping school staff with scheduling and keeping track of student homework and attendance.
- Gathering data about student performance in school, AI can identify which students are struggling and flag to teachers which students need extra support.

Example: AI can be beneficial for those with special needs—Microsoft Translator is an AI device that may help deaf students. Speechify Text Reader can make texts easier to read for those with dyslexia, impaired vision, and ADHD.

- It is important to note that such data analysis is not without its challenges. AI analysis that focuses only on learner performance might not consider the deeper issues a learner is facing at school. A holistic view of the student continues to be the gold standard when identifying how to best support learners.

Example: Designed in the UK, OU Analyse is an AI software that identifies when students are falling behind academically and allows educational support staff to effectively help these students catch up.

2) Learning and assessment

- AI can make education more accessible and have a greater impact. Here are just some of the tools AI makes available to educators:
  - Intelligent tutoring systems provide learners with individualized step-by-step tutorials. While these tutoring systems can be highly effective, they can also be prescriptive and lack the collaborative and social aspects of learning. Thinkster Math is one AI-based program combining human contact and technology to create individualised learning programs for students.[24]

  - Automated writing evaluation tools provide students with writing advice. They can also evaluate student work. This benefits the student and decreases teacher marking time. However, AI-writing evaluation tools can misunderstand texts and give students marks for longer sentences, even if the sentences do not make sense. AI-tools are also unable to assess creativity.

  - Educational virtual and augmented reality allows learners to visualize things they might not be able to see in real life for educational purposes. Students might use a VR or AR headset to visit a museum in a foreign country or even walk the surface of Mars. VR and AR can help school subjects come to life, but there is currently little guidance on how educators might use this technology effectively.[25]

3) AI Literacy:

- Having strong **AI Literacy** means understanding what AI is, how it works, and what it can do. While research on how to best teach AI literacy is still in its early stages, a variety of sources highlight the benefits of AI literacy. By integrating AI learning into school curriculums, educators can democratize access to AI literacy and AI tools from the start. Yet it is important to note that learning to use AI ethically poses challenges to many educators. AI Literacy can be broken down three key areas:

    - **Knowing and understanding AI:** The first step in achieving AI literacy is understanding how AI works and how it can be ethically applied to everyday tasks. Beyond simply using AI, true AI literacy means understanding how AI programs do what they do.

    - **Applying AI:** Once users understand what AI is and what it can do, they can integrate AI meaningfully and ethically into their daily lives. Anecdotal evidence shows that many AI users note how AI has helped them excel at school, work, and in their passion projects. Some examples are listed above.

    - **Evaluating and creating AI:** Beyond using AI to complete daily tasks, learners with high AI literacy have the skills to critically evaluate AI and develop their own AI technologies.

Many challenges exist for educators trying to use AI in the classroom. Questions around the ethics of AI use, the impact on teachers and students, and the racial and gender biases of AI continue to permeate the debate.

Digital Advocacy

If AI technologies can be built on a basis of inclusivity, equity, and diversity, can equity-seeking groups and non-profits use AI to advocate for social justice? How can non-profit organizations use AI to better serve the people who need them most?

It is no secret that for-profit companies are beginning to draw on AI to increase revenues and reduce costs. But AI use does not have to be profit driven. By using AI, non-profit organizations can raise more funds to support their work, learn more about community needs, and serve their communities more effectively.[26] Some of the ways that non-profits can use AI are:

- **Automating repetitive tasks:** Non-profits face hundreds of repetitive tasks every day. Many of these tasks do not require human creativity or high-cognitive capacities. Automating these tasks through AI frees up more time for meaningful community-focused work.

- **Understanding your stakeholders:** AI cannot replace human engagement and interaction, but it can help non-profits understand their communities better, helping them personalize their messaging and work. Have you ever wondered where most people you serve live? Or what their schedules and lifestyles are like? Once an organization has gathered data about the people it serves, AI can help find patterns within that data—making work more effective.

- **Improving customer service:** Incorporating AI chatbots into their websites helps non-profits support people more effectively. Many logistical and administrative questions can be answered by AI technology. Complex questions, however, will still require a human touch.

- **Empowering decision-makers:** Analyzing large quantities of data can help empower non-profit decision-makers. While AI cannot replace important research, like site visits or one-on-one conversations, AI can help analyze data allowing decision-makers to make more informed choices.

- **Enhancing the fundraising process:** For non-profits, fundraising is key. Using AI can help non-profits learn more about their donors. AI can help non-profits keep track of the needs and changing interests of their funders, creating more opportunities for impactful partnerships.[27]

Non-profits using AI face many challenges. Some of the more fundamental issues AI users face today are around privacy and bias. While AI programs like ChatGPT harvest text from across the internet, they do not credit the sources from which they draw information. ChatGPT will also reproduce existing errors or biases. AI users must have literacy skills to decode/read AI text as well as the critical skills to evaluate the information. While there are many positive and ethical uses of AI, it is not a substitute for human thought, experience, and understanding.

As you consider your work and your role in advocating for equity, diversity, and inclusion, consider the following questions:

- How might non-profits and equity-seeking groups use AI to advocate for equity, diversity, and inclusion?
- Can AI help create systemic changes that will lead to improved literacy levels?
- What are the risks of using AI for advocacy work?

Conclusion: Threat or Opportunity

As people across the globe begin to engage with AI daily, educators, both not-for-profit and for-profit organizations, and governments must reckon with questions about the ethics and efficacy of integrating AI into the work we do. We recommend that governments, community organizations, employers, and researchers work together to better understand what AI is and how it works and to regulate it so that it can be ethically integrated into our jobs, educational programs, and lives.

> "In summary, traditional literacy education provides a foundation for understanding written language and critical thinking, while AI literacy expands this foundation to encompass an understanding of AI systems, their capabilities, and their impact on society. By combining traditional and AI literacy, individuals are better equipped to navigate the complexities of the modern world and make informed decisions in an AI-driven society."
> – ChatGPT generated answer.

Discussion Questions

- What is the relationship between traditional literacy and AI?
- How can we integrate AI into academic curricula ethically and meaningfully?
- How can equity-seeking groups, including those who experience low-literacy and the not-for-profits that aim to serve them, use AI to better advocate for social justice?
- How can we ensure that low literacy learners are not left behind when it comes to navigating an AI-rich world?
- Bill C-27 is only the beginning of Canadian policy makers attempt to regulate AI technology effectively. What else is needed?

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