Research Projects to Address Knowledge Gaps about the Skills of Indigenous Peoples in Canada

Literature Review

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Contents

Review of Major Literature and Reports, Update on Key Informant Interviews

1. Introduction

This report examines the academic and government literature on Indigenous involvement in advanced and technical training and employment opportunities. Over the last four decades, governments and Indigenous organizations have spent hundreds of millions of dollars annually on efforts to prepare Indigenous youth and adults for participation in the wage economy. There is widespread acknowledgement that this earnest and well-meaning effort has not worked effectively, but there is much less of a consensus on the roots of the problems and the best ways of proceeding. The purpose of the literature review and the interviews with key professionals in the field is to examine the assumptions, learning and experiences in this important field.

The educational gaps between First Nations, Métis, and the Inuit populations of Canada have been well-documented by Statistics Canada and numerous OECD reports since the beginning of the *Programme for the International Assessment of Adult Literacy* (PIAAC) in 2013-14. The literature often turns to the compendium of the "5-Ds" of Indigenous/newcomer analytics: disparities, deprivation, disadvantage, dysfunction, and difference to establish its nature, origin, and to provide explanatory variables (Walter and Taylor, 2016). Indeed, as a result of Canada's colonial legacy, Indigenous Peoples often suffer from disrupted family lives, inadequate housing and healthcare, poor water, wastewater, and road infrastructure, and limited access to education and training. As such, educational gaps persist, with studies continuing to develop new and more complex ways to explore and solve this gap between Indigenous communities and newcomer society in literacy, numeracy, and problem-solving in an increasingly technological environment (or after Passey, et al, 2018, Digital Agency).

For one, researchers are beginning to recognize that there is an inherent problem in the research on the Indigenous literacy gap: Research is designed, gathered, and owned by government agencies, and is founded on the newcomer society premise that Indigenous literacy scores must be brought up to the level of newcomer's society, and that new programming and funding will bridge the gap. Once again, the Indigenous Peoples have been left out of the problem, as well as the solution. A growing number of academics have started to call for Indigenous data sovereignty and a greater foundational position for Indigenous communities, governing bodies, and academics to rethink the entire problem of Indigenous literacy, adult skills training, early childhood education, and community support systems (Rowe, West, and Russo Carroll, 2022; Walter, 2021; Taylor and Kukutai, 2016). There are more frequent recommendations from experts for Indigenous-led research projects and programming in literacy and numeracy that is designed by Indigenous people, for Indigenous people.

There is also the issue of data that is too often missing from the on-reserve Indigenous population. Those living on-reserve are not surveyed in the PIAAC, or national education and labour force survey programs. In 2021, this left 519,000 plus Indigenous peoples out of the equation entirely, a number that is close to a million in 2022 (Statistics Canada, 2016 Census of Population). This group usually lives in remote – and as the geographer Robert Bone (2003) notes -- "non-economic places" that have limited access to education, training, and Internet service. This population is younger and poorer than the average Canadian.

This report, however, is not designed around the data that researchers have used to build their perspectives on the gap between the Indigenous and Newcomer Society, nor its challenges. Researchers are generally cognizant of the limitations that each data source has. (This is not to say that the types of data that dominate the discussion, their origin, and ownership do not need to be critiqued). Instead, this report is based on the types of questions raised and ideas shared by our Indigenous Key Informants -- leaders in education, business, and non-for-profit agencies. As such, there are no sections in this review dedicated to the literacy gap between First Nations, Métis, or Inuit people compared to the non-Indigenous population per se. This statistical analysis has already been documented report after report in great detail. Nor does this review further dissect the problems around literacy, numeracy, and digital agency; rather, this review searches the literature for answers to the questions that were raised during the key informant interviews (Appendix 2).

The report draws on Canadian examples where available, but also reaches out to the numerous parallel studies on Indigenous literacy and educational policy originating from Australia, New Zealand, and the United States. The literature review stresses peer-reviewed research articles published since 2018, although a selection of pertinent materials is also drawn upon from government reports and from past foundational research papers. Other countries are also starting to look at the impact of newcomer society on the representation of nomadic people in higher education, such as Ireland with the Travellers (Joyce et al., 2022) and Great Britain, with migrants like the Roma and Irish Travellers (Brassington, 2022). There are also comparisons made between Indigenous people in Canada and immigrant populations, communities of colour, and others. These comparisons are commonly associated with studies that have large populations and apply inferential statistical models. Only a few studies report on Indigenous literacy across nations, comparing Indigenous literacy and skills programs between Canada, the USA, New Zealand, and Australia. For example, Walker (2020) discusses the unitary New Zealand Indigenous education policy versus the Canadian system with its dependency on building partnerships with provincial ministries of education. Notably, there is a lack of research on how divergent provincial and territorial government educational policies have resulted in differences in Indigenous educational and knowledge outcomes, although this would be a logical topic for a Canadian educational policy review given the country's thirteen separate educational policies.

This review also focuses on digital agency as central to the development of future literacy and numeracy programs in schools, in the home, especially due to the ongoing COVID pandemic, and in the workplace (be it an office or a heavy-duty truck operating at a remote mine site). For Indigenous people, this creates another level of complexity, as many Indigenous communities still have unstable, slow, and expensive Internet connectivity. Access to hardware and software also requires credit and credit cards, but access to banking is not always available in Indigenous communities. Indeed, for many First Nation people, the bank is still a Newcomer Society institution which has, in the past, commonly denied them service.

2. Summary of Statement of Work: Education, Competencies, Transferable Skills, and Employment of Indigenous Canadians

The Skills and Employment Branch (SEB), Employment and Social Development Canada workplan seeks information on four interrelated questions on the competencies and proficiencies of Indigenous workers in the Statement of Work (SOW). These are, in brief:

1.	**The state of foundational and transferable skills of Indigenous peoples.**
2.	**The barriers to increasing their skills.**
3.	**Opportunities for success through positive programs that support Indigenous skills development.**
4.	**The impact of the Covid-19 pandemic on Indigenous learning.**

However, there appears to be a disruption between these areas and the available literature from academia. Secondly, the major themes that underpin the key informant interviews (KIIs) are also out of alignment with SEB research interests. This created a challenge for the research team as it sought to align the academic narratives and findings, as well as the opinions of the KIIs with the SEB research agenda. This problem is, in itself, an important finding that suggests a need for fuller conversations around educational proficiency and skills development policy directions between those researching the issues and the communities to which policies are directed.

> **1. What do we know about the foundational and transferable skill levels and employment outcomes for Indigenous peoples, including women and men within this group? What are the knowledge gaps and how could these be addressed?**

This literature review provides extensive documentation on the foundational and transferable skills of Indigenous people based on research from Canada, Australia, New Zealand, and the United States. The OECD's *Programme for the International Assessment of Adult Competencies* (PIAAC) and other OECD and national census and labour force data has been analyzed, manipulated, and statistically rendered by hundreds of researchers since 2012. The literature reviewed below detail the findings of these authors. In summary, higher levels of education with proficiency in literacy, numeracy and digital agency equates with more secure employment, higher incomes, better health outcome, as well as lifelong learning capabilities.

Indigenous communities, especially those on-reserve, continue to record lower high school completion rates than the non-Indigenous population.[1] While young people in the past could recover through late entry into training programs, with "Trades and Apprenticeships" being a popular education pathway among Indigenous workers, the demand for skilled trades workers is expected to decline with automation and technological innovations, particularly in the natural resources, building trades, and long-haul trucking sectors where there is high Indigenous participation. For some years now, the percentage of First Nation people acquiring diplomas in the Trades has been in decline. Between 2001 and 2016, the percentage of total Aboriginal people whose highest education was referenced as *Apprenticeship or trades certificate, or diploma* dropped from an estimated 12.4% in 2001 to 11.4% in 2006, and by 2016 stood at 10.7%.

This is not to say that Indigenous students are not successfully starting to navigate their way through the education system. Indeed, Canada is starting to see an improvement in numbers graduating from their educational pathways. For example, in 2006, only 5.8% of Aboriginal people in Canada had attained a university degree at or above the Bachelor level;

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[1] Complied by authors from 2001, 2006 and 2016 Census of Canada, see:
http://www12.statcan.ca/english/Profil01/CP01/Index.cfm?Lang=E; https://www12.statcan.gc.ca/census-recensement/2006/dp-pd/prof/92-594/index.cfm?Lang=E; http://www12.statcan.gc.ca/census-recensement/2016/dp-pd/abpopprof/index.cfm?Lang=E;

in 2016, this figure had risen to 8.6%. But this accomplishment compares against the non-Aboriginal rate of 23.9%. The role of Indigenous higher education institutions therefore needs to be looked at as a pathway to increasing Indigenous access to education.

There are also gender differences worth noting, with a persistent gap in the higher-level educational attainment of Indigenous women and men.[2] Arriagada (2021) reported in 2016, that half (52%) of Indigenous women aged 25 to 64 had a postsecondary qualification; 14% of them had a Bachelor's degree or higher. The numbers for Aboriginal men were lower, with 46% obtaining postsecondary qualifications and only 8% who graduated with a Bachelor's degree or higher. The question here then is: *What additional barriers are reducing Indigenous men's access to higher education?* Alternatively, it can be asked: *How have universities successfully recruited more Indigenous women?*

Next, Indigenous students are under-represented in high-demand STEM/ICT sectors which Western economies are becoming more dependent on for innovation for growth.[3] The literature reviewed discusses several problems that universities and industry are having in attracting Indigenous students to the STEM and ICT sectors. STEM and ICT sectors depend upon a foundational education in numeracy and digital agency that is not readily being accessed by Indigenous students due to a lack of programming in grade schools, poor teacher recruitment, or other social/cultural factors, such as the limited integration of Indigenous Traditional Knowledge (TK) into the sciences.

The 2016 Census shows that in 2015, 41.6% of First Nations did not work, compared to 32.2% for the non-Aboriginal population.[4] Of those that did work, 44.2% of First Nations worked full-time; this figure was 52.1% for non-Aboriginals. In addition, the average number of weeks for First Nation people was 38.8, compared to 42.6 for non-Aboriginal workers. Given higher labour market withdrawal rates of First Nations workers, and fewer weeks

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[2] See: Arriagada, P. (2021) The achievements, experiences and labour market outcomes of First Nations, Métis, and Inuit women with bachelor's degrees or higher. Ottawa: Statistics Canada Catalogue no. 75-006-X. https://www150.statcan.gc.ca/n1/en/pub/75-006-x/2021001/article/00009-eng.pdf?st=mCWspwY Complied by authors from 2001, 2006 and 2016 Census of Canada, see:
http://www12.statcan.ca/english/Profil01/CP01/Index.cfm?Lang=E; https://www12.statcan.gc.ca/census-recensement/2006/dp-pd/prof/92-594/index.cfm?Lang=E; http://www12.statcan.gc.ca/census-recensement/2016/dp-pd/abpopprof/index.cfm?Lang=E;
[3] STEM - Science, Technology, Engineering and Math; ICT - Information Communications Technologies
[4] Statistics Canada. 2018. Aboriginal Population Profile. 2016 Census. Statistics Canada Catalogue no. 98-510-X2016001. Ottawa. Released July 18, 2018. http://www12.statcan.gc.ca/census-recensement/2016/dp-pd/abpopprof/index.cfm?Lang=E

worked per year on average, it needs to be queried: *Are Indigenous workers capable of maintaining their proficiency levels at the same level as non-Aboriginal workers? Are Indigenous workers able to maintain their competency/proficiency levels over time while working fewer weeks and probably suffering more layoffs due to their greater dependency on boom-and-bust resource extraction industries, construction, and food and accommodation industry positions during their working lives?*[5] The literature probes the PIAAC, OECD databases, and national census and labour force data extensively -- using everything from descriptive to inferred statistics, as well as critical theory; however, the maintenance or decline of literacy, numeracy, and digital agency skills over time is not found in the research. This area requires future research.

> **2. What are the main barriers faced by Indigenous peoples to increasing their skill levels and further integrating into the labour market? Do Indigenous women face additional barriers? If so, what are they?**

The barriers faced by Indigenous people with respect to increasing their skills levels are numerous and begin with seriously disruptive colonial legacy. It is therefore no surprise that there is a lack of trust in western governments and their education institutions. This brings us to one of the common themes in the literature, which is supported in the key informant interviews: Success has to be built within Indigenous communities through and by Indigenous-led programming. Work needs to continue to improve Indigenous access to teaching programs, to increase the number of teachers in the classrooms and administration who understand Indigenous culture and traditional knowledge, and who can serve as role models. There is a need to increase access to Indigenous language opportunities, to increase the participation of elders in educational settings, and to support Indigenous school boards.

Barriers are also geographic in nature, not merely social and political. Many Indigenous communities are located in what Robert Bone describes as non-economic places or in

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[5] These sectors represent 24% of all Aboriginal employment based on the 2016 Census of Canada Total - Industry - North American Industry Classification System (NAICS) 2012 for the labour Force population aged 15 years and over in private households - 25% sample data, by Industry category. Statistics Canada. 2018. Aboriginal Population Profile. 2016 Census. Statistics Canada Catalogue no. 98-510-X2016001. Ottawa. Released July 18, 2018.

regions that depend upon the boom-and-bust cycle of natural resource-based economies. The training and skills uptake in these sectors of the economy are usually at variance with the economic investment and extraction cycles, resulting in a dependency on fly-in/fly-out (FIFO) workers who are skilled, mobile, and already proven as ready-to-work. These workers are part of existing networks of miners, oil and gas workers, and foresters who have worked for natural resource firms for years and are linked into industrial hiring cycles. In contrast, Indigenous workers often lack the skills required by the extraction firms, he experience, and the networks required to break into the existing labour market. Recently, comprehensive benefit agreements (CBAs) or impact and benefit agreements (IBAs) have been growing in popularity as a way to level the playing field for Indigenous employees and other under-represented groups. CBAs or IBAs are involve commitments from resource companies in terms of jobs, training and commercial contracts for Indigenous firms. There are over 400 such agreements in the mining sector alone, with hundreds more in other resource and development projects. This allows workers to get the training, skills, and hours of work required to break into existing employment networks.

Next, there is also a gender and disability aspect to consider. Indigenous women face a vastly different labour market composition from their male counterparts, as well as unique challenges. For instance, Indigenous women are disproportionately located in remote communities. This, however, does not translate into them being less educated. In fact, on average, Indigenous women have higher education attainment levels than males: According to the 2021 Census, 65.5% of graduated high school, compared to 57.3% of Indigenous males. Females are also more likely than males to have a university degree (10.7% and 6.3%, respectively). Given the projected decline in demand for low-and-semi-skilled labour in the evolving Canadian economy, this may put Indigenous males at higher risk of being left-behind, and less capable of transitioning into the digital age due to limited educational attainment.

Interestingly, despite higher education attainment levels, a lower percentage of Indigenous women were participating in the labour force than men – at 58.6% and 64.5%, respectively. Part of this may be explained by the fact that women are often expected to withdraw from the labour force to be primary family caregivers. Another trend worth noting is that while males traditionally dominate the natural resources and transportation sectors, females are more involved in health services, public administration, and education.

Indigenous people also have much higher level of disabilities compared to Newcomer Society. Statistics Canada (2017) finds that the prevalence of disabilities varies between Indigenous groups, with close to a third of both First Nations people living off-reserve (32%)

and Métis (30%) aged 15 and older having at least one disability.[6] In contrast, only 22% of the non-Indigenous population had a disability. Pain-related disabilities were much higher in the First Nation off-reserve than the non-Aboriginal population (difference of 8.0 percentage points), followed by mental health-related disabilities (6.8 percentage points) and learning disabilities (3.8 percentage points). These disabilities all hamper learning ability, literacy, numeracy, and digital agency.

In addition, Hahmann et al. (2019) find that compared to non-Indigenous people, the predicted disability rates for First Nations people off-reserve and Métis were much higher at younger ages but converged at older ages. In contrast, for younger Inuit, predicted disability rates were quite similar to the non-Indigenous population, but these rates diverged for older Inuit, such that older Inuit had a higher predicted disability rate than non-Indigenous people.

Across all three Indigenous groups, younger women had higher rates of disability than men. However, these sex-based differences decreased with age. Statistics Canada also finds that Indigenous women were more likely than men to have various disability types. Compared to men, First Nations women living off-reserve and Métis women were more likely to have pain-related, flexibility, mobility, mental health-related, seeing, and dexterity disabilities. Meanwhile, Inuit women were more likely than Inuit men to have pain-related and mental health-related disabilities.

The literature on skills and training, educational proficiency, and labour force activity does not specifically address Indigenous people with disabilities. Nor does the literature explore higher level of disabilities in Indigenous communities as an explanatory factor for the existing skills gap, an oversight that needs to be addressed. The Key Informant discourse also fails to address this issue.

This is problematic, as past research has shown that disability tends to increase with age, and the Indigenous population is young: Inuit were the youngest of the three Indigenous population groups with an average age of 27.7 years, followed by First Nations people at 30.6, and Métis at 34.7 years (Statistics Canada, 2018). Among the general population, the average age was 41 years (Statistics Canada, 2016). Disability will therefore become an increasingly prevalent issue among Canada's Indigenous population.

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[6] See: Tara Hahmann, Ph.D., Nadine Badets, and Jeffrey Hughes (2019) *Aboriginal Peoples Survey: Indigenous people with disabilities in Canada: First Nations people living off reserve, Métis and Inuit aged 15 years and older,* Ottawa: Statistics Canada. https://www150.statcan.gc.ca/n1/pub/89-653-x/89-653-x2019005-eng.htm

There is a clear need for further investigation into the role of health -- specifically, disabilities -- which is not currently explored in the literature as factors that impede on the participation of Indigenous people in education and the economy. Hahhman (2019) concludes: "The high prevalence of chronic pain and mental health conditions among Indigenous peoples has been linked with social inequalities associated with the social determinants of health stemming from colonialism." Under-reporting is also a possible issue with health data of this nature "due to cultural bias in diagnostic instruments as well as perceived bias, stereotyping, discrimination, and stigma."

> ### 3. What are some proven or promising practices or avenues to address these barriers and/or increase skill levels for Indigenous peoples?

OECD data and other longitudinal data linkages show that, time and time again, the more years of schooling attained, the better the outcomes for employment and income. As such, Indigenous uptake of educational and skills trainings offerings will be key to improving their educational outcomes and skills development. The literature suggests that increased Newcomer Society awareness of Indigenous society (e.g., Indigenous Traditional Knowledge, social values, political systems, languages) will help facilitate changes in government programming and educational models, ultimately improving Indigenous recruitment and retention.

Getting to the challenge of improving Indigenous education and skills training in the early years is also an ongoing theme in the literature and amongst the key informants. Solutions include increased opportunities for Indigenous self-government, and the drawing down of federal/provincial powers to create Indigenous-led solutions to community challenges. Communities themselves need to drive the solutions, with community developed learning programs created by, or with, Indigenous educators.

Community development corporations represent another untapped agency to drive educational competency within Indigenous communities. The Indigenous population contributes over $32 billion annually to Canada's GDP, with the private sector economy contributing just over $12 billion. In many cases, Indigenous development corporations represent a stable platform for on-the-job business training and skills development and should be better leveraged for future educational and skills training.[7]

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[7] See Carol-Anne Hinton, The Indigenomics Institute, https://indigenomicsinstitute.com/about-us/

Whether delivered by educational institutions or Indigenous development corporations and businesses, there needs to be more skills programming that stresses Indigenous STEM and ICT opportunities which include Traditional Knowledge to bridge the gap between Indigenous and non-Indigenous workers. Programs that spark an interest in, and support, entrepreneurial ability in Indigenous communities could help break the boom-and-bust cycles of employment in the natural resources.

Last, basic programs in financial and health literacy could also help stabilize household incomes and improve health outcomes in Indigenous communities which are commonly underserved by both banking institutions and health services.

> **4. What are the impacts of the Covid-19 pandemic on Indigenous learning?**
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> **What are some proven or promising practices or avenues to address the**
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> **barriers and/or increase skill levels for Indigenous peoples?**

Indigenous communities, especially those in rural and remote areas, suffered inordinately during the COVID-19 pandemic. Initial health statistics indicate a higher rate of infection and death among Indigenous people despite Health Canada's directed and early roll-out of vaccinations to Indigenous communities. The 2016 Census reports that 29.7% of off-reserve First Nation households are low-income, compared to 13.8% of non-Aboriginal households. It stands to reason that many First Nations households will have been ill-equipped to participate in the digital agency learning environment that replaced schoolrooms across Canada.[8] The closure of most Indigenous government offices and schools during COVID-19, coupled with some communities' weak digital agency, low internet connectivity, and lower educational attainment will have contributed to lost months, if not years, of schooling. Indigenous children are already more likely to miss more school days than non-Indigenous children, and many of them attend schools in remote communities that were already dealing with high teacher turnover rate and difficulty recruiting teachers. Indigenous governments and organizations also control a considerable number of skills development and training program dollars, although the preoccupation of Indigenous governments with pandemic priorities resulted in less engagement with these programs over the past three years. Coupled with the legacy of the residential school system, the COVID-19 pandemic likely exacerbated the gap in essential skills development between Indigenous children and non-Indigenous children; this merits greater efforts by policy makers and educators to rectify the

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[8] Statistics Canada. 2018. Aboriginal Population Profile. 2016 Census. http://www12.statcan.gc.ca/census-recensement/2016/dp-pd/abpopprof/index.cfm?Lang=E

growing gap, with a focus on the return of Indigenous students of all ages to their classrooms and training programs.

Lee et al. (2021) conducted 31 key information interviews in Kingston, Ontario and identified three major themes impacting Indigenous learners: school closures, home safety, and limited ability to capitalize on available outdoor spaces. School closures were generally reported as negatively impacting learning and social development; however, "school closures allowed for some Indigenous children to be removed from a colonized education system, contributing to cultural and spiritual growth." Second, respondents reported increased severity and frequency of domestic violence, which negatively impacts child well-being. Third, the closure of public outdoor spaces created barriers to maintaining good physical health for children.[9] The idea that school closures created an opportunity for land-based Indigenous teaching is also supported by Kiera Brant--Birioukov (2021): "We see evidence of other First Nations, Inuit, and Métis communities that see school closures not as a catastrophe but as an opportunity (…) to reintroduce their youth back onto the land."[10]

Boom-and-bust cycle jobs in the natural resources sector, and the food and accommodation sectors were devastated by COVID-19 closures. Many Indigenous workers in the labour force are in these sectors, and had their on-the-job education and training disrupted, with the risk of not having jobs to return to as the economy rebounds.

In a 2021 submission to The United Nations,[11] Human Rights Watch provided a policy brief on the need to address the gaps that are expected to occur post-pandemic between the Indigenous and non-Indigenous populations in Australia, Canada, Colombia, Indonesia, New Zealand, and the United States.[12] Some of their recommendations included:

- Carry out national "back to school" communications and mass outreach campaigns to persuade communities and children who have been out of school -- either due to the pandemic or other reasons -- to return to school.

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[9] Lee, H.; Bayoumi, I.; Watson, A.; Davison, C.M.; Fu, M.; Nolan, D.; Mitchell, D.; Traviss, S.; Kehoe, J.; Purkey, E. (2021) Impacts of the COVID-19 Pandemic on Children and Families from Marginalized Groups: A Qualitative Study in Kingston, Ontario. *COVID*, *1*, 704-716.

[10] Brant-Birioukov, K. (2021) 'Covid-19 and Ingenuity: Lessons from Indigenous resilience, adaptation, and innovation in times of crisis', Prospects (Paris), 51(1-3), 247–259.

[11] Human Rights Watch (2021), Submission to The United Nations The Expert Mechanism on the Rights of Indigenous Peoples. https://www.hrw.org/sites/default/files/media_2021/03/EMRIP%20Submission.pdf

- Indigenous organizations should be strongly involved in consultations and decision-making processes regarding school reopening and programming.
- When children return to schools after periods of lockdown, or previous exclusion, ensure schools assess students' level of learning in each subject, and assign them to small cohorts of students at a similar level where teaching can most appropriately respond to their current level, including through free extra tutoring where necessary.
- Progressively strengthen the content and availability of technical and vocational training, alternative basic education opportunities, including universal adult basic education programs, and life-long learning opportunities for older children who left school during the pandemic, but in the years to come, may wish to return to studies; or children who were previously excluded from the formal education system.
- Allocate adequate resources to ensure excluded Indigenous populations have equal access to inclusive quality education. Where necessary, build or strengthen schools closer to children who have limited access to education and allocate additional qualified teachers, particularly Indigenous teachers.

The recommendations by Human Rights Watch closely parallel the published research in the field as well as the opinions and thoughts of our key informants. The stress throughout is on improved communications, greater Indigenous community involvement in decision-making, and the need for an increased Indigenous presence in the classroom as teachers, traditional language speakers and elders.

This report to the Skills and Employment Branch (SEB), Employment and Social Development Canada reviews the literature and reports with input from Key Informant interviews as per Task 5 in flow diagram.

Task 1: Project Initiation Meeting

- Clarification of the project's purpose, objectives, and expectations
- Collaboration the matters listed above will result in a common understanding of the expectations for the assignment and an agreed upon coordinated approach
- Completed and approved project methodology

Task 2: Building the Bibliography

- Bibliography of academic literature delivered in Excel
- Master list of all literature by the to be determined theme categories
- Document search pathways used

Task 3 Review related literature and reports

- A draft report to the client that review the key research findings of scholars and policy analysts working in the field of Indigenous education with reference to the skills gap and directions for future research and data gathering, possibly including ideas for the design of survey instruments to fill data gaps.

Task 4: Carry out recorded interviews

- A draft report to client the reviews the findings of the key informant interviews.
- Interview Transcripts

Task 5: Prepare Final Report and Bibliography

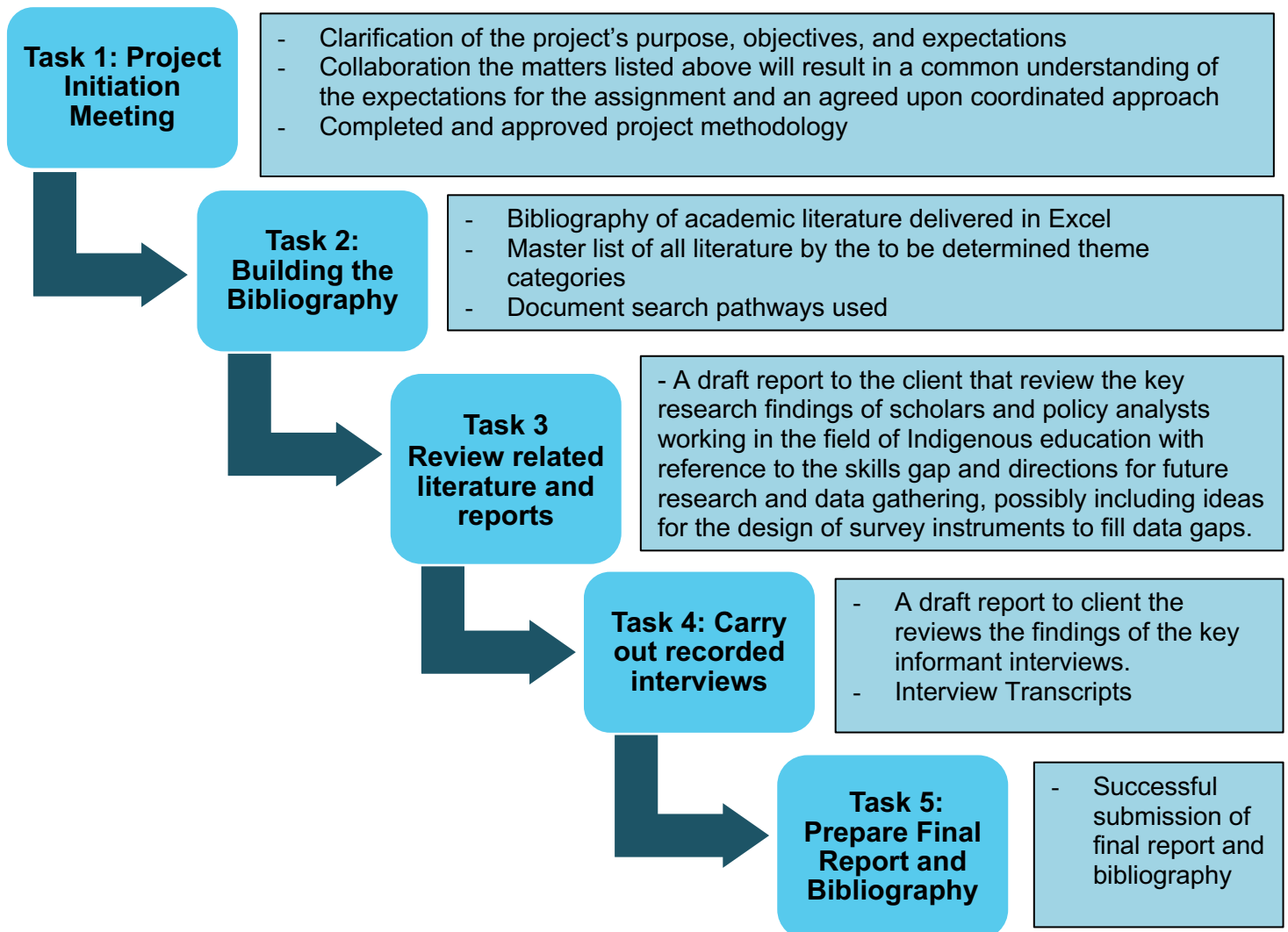- Successful submission of final report and bibliography

Figure 1: Tasks Outline

3. Literature Review - Addressing Knowledge Gaps about the Skills of Indigenous Peoples in Canada

Many countries have Indigenous populations that suffer from inequalities in access to education, the job market, and political rights. This literature review builds on previous publications related to the Indigenous and Newcomer Society skills gap circa 2018-2022. The review is augmented by a series of in-depth interviews with Indigenous educators, human resource experts, and businesspeople who volunteered to share their ideas and their time with our researchers. The literature review includes relevant published academic articles in referred journals, government reports, and think tank opinion pieces, based on research using PIAAC results from Canada, Australia, New Zealand and the United States of America. The interviewees' opinions and ideas are woven into the text of the literature review. Evidence stems from other datasets mostly within the public realm and available through Statistics Canada. Increasingly, scholars are using interviews and community case studies including Indigenous traditional knowledge to measure and address the relative levels of preparation between Indigenous and newcomer populations, including questioning the acceptability of a singular western model of knowledge and skills.

The OECD's Programme for the International Assessment of Adult Competencies (PIAAC) has been the primary source for hundreds research papers that examine the skills gap between Indigenous people and Newcomer Societies. The PIACC is designed to test literacy, numeracy, and problem-solving skills. It also includes a Survey of Adult Skills which gathers information on how adults use their skills at home, at work, and in the wider community. The Survey of Adult Skills is administered by participant countries' statistical agencies and program providers across the OECD.

Canada's 2012 PIACC report produced striking results. First Nation people living off-reserve were substantially behind other Canadians in literacy, numeracy, and problem solving (including technology/computer competency). In some Canadian regions, the results were comparable to the scores associated with developing countries.[13]

Canada needs to be particularly concerned about these gaps as the Indigenous segment of the Canadian population is young and fast-growing. Recent Statistics Canada (2021) demographic projections show that the Indigenous population has been growing steadily

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[13] OECD Averages for Literacy 268, for Numeracy 263, Indigenous Saskatchewan scored 248 and 232, in comparison Turkey scored 227 and 219, while Canada scores were Literacy 274 and Numeracy 265. https://www2.compareyourcountry.org/adult-skills and https://www.cmec.ca/Publications/Lists/Publications/Attachments/315/Canadian-PIAAC-Report.EN.pdf

in recent decades, and will continue to increase: In 2016, the Indigenous population was estimated at 1,800,000, and could reach between 2,495,000 to 3,182,000 by 2041.[14] The growth in the Indigenous communities is attributed to higher fertility, improving health outcomes, increased self-reporting of Indigenous heritage in the Census, and increasing acceptance of Métis status by people of mixed ancestry. The First Nations population is also younger than the general population (with the Inuit being younger still), and they will continue to be younger through 2041, with the median age changing from 27.2 years in 2016 to between 36.0 to 36.5 years in 2041. In comparison, the median age of the non-Indigenous population is projected to increase from 41.4 to 44.7 years over the same period. The current educational gaps exposed by the 2012 PIAAC findings are not going to disappear without major interventions from the community, their schools, and the government programs and services that are designed with and for them. First Nations students living and studying off reserve have significantly higher levels of academic achievement, a reality that likely reflects more on the quality of teaching and educational facilities than the abilities of the students.

The Survey of Adult Skills' scores supplement 2012 PIACC findings by providing an indicator of the quality of human capital in a country. This test score measure skills for the entire working age population by 5-year cohorts, which facilitates the construction of a stock of human capital by averaging literacy, numeracy and problem-solving test scores across age groups (Egert, 2022). PIAAC is often paired analytically, and for policy purposes, with data from the Programme for International Student Assessment (PISA) which looks at the educational levels of students within the OECD and participating countries, again focusing on literacy, numeracy science, plus mean years of schooling (MYS).[15] Egert et al. (2022) illustrates Canada's strong position in relation to human capital.[16] Using a base scale of between 250 and 300 points Canada scores very highly,

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[14] These projections are based on data from the 2016 Census, which were adjusted to account for, among other things, census net undercoverage and the population living on incompletely enumerated Indian reserves and Indian settlements. Because of these adjustments, the figures presented here for 2016 may differ from those obtained directly from the 2016 Census. See: Surveys and statistical programs - Projections of the Indigenous populations and households in Canada (statcan.gc.ca)

[15] Since 2000, the PISA survey has been conducted every three years to evaluate the extent to which 15-year-old students have acquired key knowledge and skills essential for full participation in social and economic life. To this end, standardised tests are conducted to assess students' knowledge and skills in three subjects (mathematics, reading and science) for around 80 countries.

[16] *Égert, B., C. de la Maisonneuve and D. Turner (2022), "A new macroeconomic measure of human capital exploiting PISA and PIAAC: Linking education policies to productivity",* OECD Economics Department Working Papers*, No. 1709,*

above Great Britain and well in advance of the USA, scoring behind OECD countries Korea, Finland, and Japan with an almost identical score to Australia in the 16–39-year-old age group (Figure 2).

Figure 2: Population aged 16-39 years
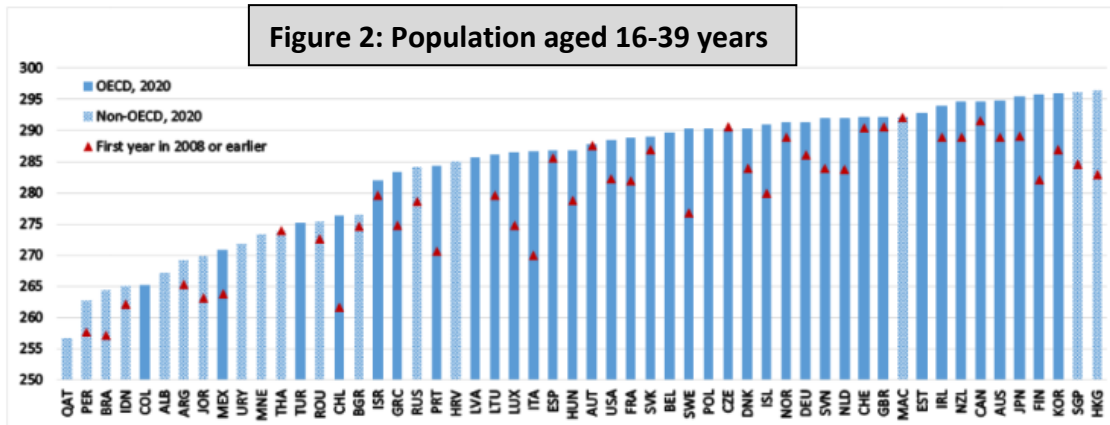
Note: The stock of human capital is calculated as the cohort-weighted average of student test scores adjusted for the coefficient estimates linking PIAAC adult test scores to PISA student test scores (log-log specification with country fixed effects, transformed from log to levels). The first years in panel B range from 1987 to 2008.

Human capital effects on productivity are potentially large but come with long lags

The new measure of human capital shows a robust positive correlation with productivity for OECD countries in cross-country time-series panel regressions, suggesting that improvements in human capital are accompanied by macroeconomic productivity gains.

However, Canada's national performance must be qualified by further study on sub-groups within the population, including First Nations, Metis, Inuit, immigrants, people of colour and those with disabilities. Egert et al. (2022) find that:

"The potential for long-run productivity gains is much greater from improvements in the quality than the quantity component of human capital. An improvement in PISA test scores, equivalent to closing the gap between the median and the top three performing OECD countries, eventually generates a long-run increase in

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OECD Publishing, Paris, and https://oecdecoscope.blog/2022/04/21/a-new-aggregate-measure-of-human-capital-linking-education-policies-to-productivity-through-pisa-and-piaac-scores/

multi-factor productivity (MFP) of between 3.4% and 4.1%. Alternatively, a similar increase in mean years of schooling, also corresponding to reducing the gap between the median and the top three performing OECD countries, generates an increase in TFP of between 1.8% and 2.2%."

This connects the quality of the educational experiences (defined by academic achievement and credentials earned) to the numbers of years in the classroom, adding complexity to the evaluation. The findings on the higher value of improved quality over years of education needs to be factored. Now, more than ever, Canada needs to invest in improving the quality of Indigenous education while also striving to create a more relevant learning experience for Indigenous youth that will give them the rationale to stay in school longer. Canada does not have national body of education, with youth and adult education organized at a provincial level. As such, Indigenous education policies vary province-by-province, and across the three Territories which have high representation of Indigenous people within their populations (Walker, 2020). As Walker comments in her comparison of Indigenous adult education policy in New Zealand and Canada: "NZ is a centralized, highly regulated adult education system whereas Canada has a plethora of policies at both provincial and federal levels; and though there is a desire for greater collaboration/coordination, there is nothing that really comes close to an adult education system."

Finnegan and Coates (2016) also note that an effective anti-poverty strategy incorporates the enhancement of education and skills among households, as there is a long-standing correlation between poverty and lower educational attainment.[17] Vézina, Bélanger, Sabourin, et Marois (2019) note that the factors linked with literacy proficiency among the working-age population are multiple. Nonetheless, in Canada (and elsewhere), education and school remain the main source of literacy proficiency. Other determinants play significant roles as well, such as exposure to social capital in early childhood (measured in their study by the mother's education level).

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[17] For an example of OECD work on human capital and education, Egert (2022), Box 1. Past OECD Economics Department work on macroeconomic measures of human capital., page 7.

Literacy Skills in PIAAC

The PIAAC literacy measures assess the ability of adults aged 16 to 65 to read information presented in text, charts and graphs and, importantly, to apply what they have read. Defined thus, literacy has been shown to have a significant impact on the efficiency of learning and on the productivity of workers. In an economy in which automation is reducing the demand for workers who are only required to apply routine procedural knowledge and is increasing the demand for workers who can fluidly solve information-intense problems with the help of computers and in heterogeneous teams, advanced literacy skill will be a prerequisite for getting and maintaining employment and for attracting a living wage. The analysis is run separately for literacy and numeracy, while the focus is on literacy. Since both numeracy and literacy skills are highly correlated (correlation coefficient >0.8 at the individual level), the literacy measure will also capture some of the impact of numeracy on growth (and vice versa). The estimation captures the impact of both the level of skill available and the efficiency with which the skills are applied at work to the extent that these two inputs are correlated. One could include the PIAAC skill utilization indices to detect the uncorrelated marginal impact of skill utilization differences among countries on growth rates, but we refrain from doing so to remain consistent with the Coulombe, Tremblay and Marchand analysis.

Schwerdt, Wiederhold, and Murray (2020)

Case studies that demonstrate the merit of adult literacy programming are in short supply. One positive review of a First Nation adult literacy program is provided by Boughton et al. (2022) in "Measuring adult English literacy improvements in First Nations communities in Australia." They find that the prevalence of low to very low adult English literacy levels in First Nations communities continues to be an issue, despite ten years of government-supported Foundation Skills training provided through the national vocational education and training system. Their study contrasts the Government of Australia's approach with an innovative First Nations community-controlled approach to improving adult literacy training, utilizing an internationally recognized mass campaign model. Literacy improvements were assessed for 63 participants in 6 communities, using validated pre- and post-tests aligned to the Australian Core Skills Framework (ACSF). Overall, 73% of participants improved their literacy, defined as moving up at least one level on one or more of six ACSF indicators. The number of lessons completed, and entry ACSF literacy levels were significantly associated with literacy progression, with previous school education positively associated but not statistically significant with the minimum number of lessons associated with literacy improvement is estimated as 47–49 (80–83% of lessons) (Boughton et al., 2022). The stress here is on community-control of the program

and the delivery of the program with an Indigenous context while maintaining a nationally approved testing and scoring system for comparative analysis.

3.1 Proficiency as a Concept used in PIAAC

To describe the performance of adults in the three domains of literacy, numeracy, and problem solving in PS-TRE environments, the term "proficiency" is sometimes used in this report. Proficiency is defined as "a continuum of ability involving the mastery of information-processing tasks of increasing complexity" (OECD, 2013c, p. 64). Proficiency is divided into "proficiency levels" based on score-point ranges and the difficulty of the tasks within these ranges. These levels suggest what adults with specific proficiency scores in a particular skills domain can do. Six proficiency levels are used for literacy and numeracy (Levels 1 through 5, as well as below Level 1), and four for PS-TRE (Levels 1 through 3, as well as below Level 1). It is important to note that proficiency levels are not meant to represent standards or benchmarks but are intended to aid in the interpretation, understanding, and comparability of findings (Canada, Council of Ministers of Education, 2021).

3.1.1 Transferable Skills Defined and "Competencies"

The 2019 OECD's Survey of Adult Skills Reader's Companion defines competency as the:

> *capacity to generate appropriate performance: to marshal the resources (tools, knowledge, techniques) in a social context (which involves interacting with others, understanding expectations) to realize a goal that is appropriate to the context. Commonly, competency is described in terms of the application and use of knowledge and skills in common life situations as opposed to the mastery of a body of knowledge or a repertoire of techniques.*

There are four defining features to key competencies. Key competencies:
- constitute a prerequisite for achieving the desired outcome or outcomes, e.g., for a "successful life and a well-functioning society" (Rychen and Salganik, 2003), as preparation for the (emerging) labour market (Mayer, 1992), or for "personal fulfilment, active citizenship, social cohesion and employability in a knowledge society" (European Commission, 2007),
- are relevant to all individuals,
- can be learned, and

- are generic or highly transferable competencies that are relevant to multiple social fields and work situations, as opposed to competencies that are only relevant in specific occupations, industries or types of activity.[18]

This has been translated into the education/learning/training sector as "transferable skills [that] include the ability to solve problems, communicate ideas and information effectively, be creative, show leadership and conscientiousness, and demonstrate entrepreneurial capabilities. People need these skills to be able to adapt to different work environments and so improve their chances of staying in gainful employment."[19]

Employers want assurances that young people applying for jobs have at least strong foundation skills and can deploy their knowledge to solve problems, taking the initiative and communicate with team members rather than just following prescribed routines. These transferable skills are not taught from textbooks but can be acquired through good quality education. Employers often indicate that these skills are lacking in new recruits to the labour market.

Two prominent schools of thought dominate the literature on the role of education as a determinant of employment prospects. Indeed, many recognize that there are personal and national benefits to education. For one, Calvert notes that:

> *The aggregate national benefits are often found to exceed the total private benefits captured by individuals, suggesting that there are significant positive externalities associated with education.*

Haan et al. (2020) also posit a positive link between education and income which aligns with the basic human capital model. Why does education have such a positive impact on individual economic outcomes? There are two major explanations. The first explanation is that education raises human capital through developing knowledge, cognitive skills (math, literacy, and reasoning) (Ishikawa and Ryan, 2002; Heckman, 2006), and non-cognitive skills (e.g., interpersonal skills, organization skills) (Brunello and Schlotter, 2011). These improvements in human capital make the workforce more productive. This is typically the stated purpose of education. The second explanation is that the role of

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[18] See: https://www.oecd-ilibrary.org/sites/844b69e3-en/index.html?itemId=/content/component/844b69e3-en

[19] UNESCO. 2012. EFA global monitoring report, 2012.Youth and skills putting education to work, summary. Paris: UNESCO

education is to screen individuals by signaling certain traits or abilities.[20] This view suggests that the value of a credential is not derived from what individuals have learned in earning it, as much as from the evidence it provides of pre-existing attributes which allowed the individual to earn the credential in the first place.

In the post-COVID era, as students return in-person to their educational institutions, it is important to improve our understanding of the unique challenges and barriers that have held back Indigenous educational attainment throughout the pandemic. Indigenous schools, families, and children were perhaps the least capable of fully participating in the home-education programs that school systems relied on to deliver curriculum over the past two years.

In 2019, prior to the pandemic, 87.4% of Canadian households, including 98.6% of urban households and 45.6% of rural households, had access to services that met or exceeded the Canadian Radio and Television Commission's universal service objective or ensuring that all Canadian have access to high-speed Internet. In contrast, only 34.8% of First Nations reserves had such access (Library of Parliament 2022). Figure 3 shows the variation in broadband speed and availability on First Nations reserves by province and territory. Notably, there is considerable divergence in access to broadband internet within First Nation communities. The findings of the report on internet access produced by the Canadian Council of the Academies are worth reviewing as they are one of the first post-COVID Canadian agency reports to address the technology gap that impacts First Nations' education and training opportunities.[21]

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[20] For example, see: Layard, R., and G. Psacharopoulos (1974) "The Screening Hypothesis and the Returns to Education," *Journal of Political Economy*, Vol. 82, No. 5, pp. 985-998, and Spence, M. (1973) "Job Market Signaling," *Quarterly Journal of Economics*, Vol. 87, No. 3, pp. 355-374.

[21] Canada Council of the Acadamies, Waiting to Connect: The Expert Panel Report on High-Rhrougput Networks for Rural and Remote Regions in Canada (Ottawa: 2021).

Figure 3: Availability of Broadband Internet on First Nations Reserves, Provinces and Territories by Speed, 2019 (Percentage of households)

Note: Analysis of broadband availability is based on First Nations reserve areas according to Statistics Canada census data. The term "reserve" is defined in the Canadian Radio-television and Telecommunications Commission's 2020 *Communications Monitoring Report*. Nunavut is excluded from the figure as there are no reserves in the territory. In Nunavut, broadband availability by category is 99.6% for 5 Mbps+, 0% for 25 Mbps+, 0% for 50/10/unlimited and 0% for 100 Mbps+. Data for Nunavut are reflected in the data for Canada.

Source: Figure prepared by the Library of Parliament based on data obtained from the Canadian Radio-television and Telecommunications Commission, "LTE and Broadband Availability," *Communications Monitoring Report*.

Before the COVID-19 pandemic, lack of broadband Internet access already affected Indigenous communities in several ways:

- Indigenous governments encountered challenges in providing e-services to their communities and participating in online commerce opportunities.
- Bandwidth limitations affected the use of video conferencing, access to distance education, and Internet use in the classroom.
- Some Indigenous People had to leave their communities to access health services. However, broadband Internet access could allow for locally accessible virtual care.
- Indigenous youth have limited opportunities to learn digital skills, which may affect their economic participation.[22]

The COVID-19 pandemic highlighted the importance of access to broadband Internet as work, school, and many services shifted online. However, Indigenous communities without broadband Internet access faced challenges, including:

- In northern Canada, many people experienced difficulties working from home.
- Distance education was impossible in many First Nations communities and challenging for many Indigenous post-secondary students.
- Limited broadband Internet affected access to health and mental health services.
- For Indigenous People with disabilities, lack of access to broadband Internet or digital resources may have worsened pre-existing health care barriers by limiting access to online supports and services, and the ability to connect with loved ones.
- There were impacts on Indigenous businesses, including those located in Indigenous communities.[23]

The Parliament of Canada (year) report on the inequality of access to broadband in on First Nations reserves First Nation-Reserves concludes that:

> *Indigenous communities are disproportionately affected by the lack of broadband Internet access because it exacerbates long-standing inequities in areas such as*

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[22] Andrew Schrumm et al Building Bandwidth: Preparing Indigenous youth for a digital future
   (RBC, Toronto: 2021).

[23] Shannon Chalmers et al, Impact of COVID-19 on businesses majority-owned by various sub-population groups and visible minorities, third quarter of 2021 (Ottawa: Statistics Canada, 2021).

health, employment and education. Even where broadband Internet is available, it may be inaccessible to Indigenous People if it is too expensive and/or Indigenous People lack digital devices. Factors contributing to the absence of reliable, affordable broadband Internet in some Indigenous communities include high infrastructure and maintenance costs, low revenues for providers, challenges with timely resolution of network issues in remote communities, and short shipping and construction seasons for installing necessary equipment.

While these findings are for First Nation reserves, Indigenous people living in urban areas may not have equal access to broadband services or the technology required to participate in online learning due to low income and the high costs of broadband and computer technology.

Last, in interviews with Indigenous educators, one who grew up in a remote community noted that another factor that has a negative impact on student development is teacher transiency, a topic in need of greater research and analysis. Indeed, there appears to be an elevated level of transiency in the "helping" professions (e.g., teachers, trainers, support workers), which exacerbates Indigenous education and workforce problems. In an interview-based case study on a Fly-in/Fly-out mining project in the Yukon, Saxinger and Gartler (2017) note that: "It is important to have role models in the community who are successful, who can talk about their jobs, and inform younger people about what mining has to offer."

3.1.2   A note on terminology

This study uses the term Indigenous as a collective form for First Nation, Inuit, and Métis people in Canada, as recognized in Section 35 of the Constitution Act, 1982. This literature review follows the main lines of research in Canada which tends to discuss the Indigenous people as a collective, but focuses on First Nations, Metis, and Inuit distinctions where available.

In the Canadian Census, Indigenous is a self-defining term, as are First Nation, Métis, and Inuit. This question is about personal identity, not legal status or registration. However, rules apply within Indigenous Services Canada when "status" and non-status" come into play, an issue the Supreme Court of Canada has increasingly had to interpret, (for example: R. V Desautel, 2021).   However, designations for on/off-reserve face

limitations in the PIAAC and other key data sources, which are central to comparing and understanding adult skills and competency across ethic/cultural groups in Canada.[24]

The term "Newcomer Society" also requires unpacking. The American Native Studies researcher McKay defines it as:

> *Researchers in Native studies, critical ethnic studies, geography, and other social science disciplines actively interrogate the intersectional relationships between race, gender, capitalism, empire, and settler-colonialism. Within these fields, scholars examine questions such as how anti-racist work aimed at legal and cultural entitlements perpetuate Indigenous dispossession, how the racialization of Indigenous peoples as racial minorities has been deployed as a means to appropriate Indigenous lands, and how these processes shape not only Indigenous and white racial formations but also the racialization of all peoples, producing contradictory racial-colonial formations in Black, Chicano/a, and Asian American communities.*

Veracini (2008) describes *"Newcomer Society as, by definition, premised on the traumatic, violent replacement and/or displacement of Indigenous others."* Daschuk (2013) documents how this displacement occurred in western Canada through government policies and settler ignorance and culpability that stressed the alienation of land and sovereignty. On-reserve resettlement and other policies resulted in the loss of language and culture, and also led to genocide through disease and starvation. The Truth and Reconciliation Commission documented the impact of the residential school system, a legacy that has most recently been exposed yet again through the scandal of the unmarked children's graves (MacDonald and Hudson 2012, Wilk, Maltby, Cooke, 2017). Coulthard (2014) contends that contemporary colonial power and hegemony work not through a process of exclusion, but through the inclusion and shaping of Indigenous peoples and perspectives by state discourse. He argues that self-determination cannot be bestowed upon by the state but must result from Indigenous resurgence, even if it challenges the legitimacy of the Canadian settler state. Recognition practices do not rectify colonial injustice but reaffirm the settler state's legitimacy. Moreover, mutual recognition in a colonial context is impossible since the Canadian state does not require recognition from First Nations, Métis, and Inuit peoples to exist (Cook, 2018). Stasiulis

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[24] R. vs Desautel, April 23, 2021, 2021 SCC 17 https://www.scc-csc.ca/case-dossier/cb/2021/38734-eng.aspx

(2020), in an analysis of how Canada uses and disposes of migrant labour "human waste" notes that: "Canadian social justice scholarship has seen a notable resurgence in interest in the framework of settler colonialism for illuminating "ongoing colonialism, the dispossession of Indigenous lands, and the actual/attempted elimination of Indigenous peoples" in order to inform and support movements for Indigenous resurgence."

Newcomer Society is not static, it is evolving and changing as a population vis-a-vis the Indigenous population, as Canadian immigration policies continue to offset an aging, older Newcomer Society population with younger skilled and educated immigrants. Immigration may have direct and indirect positive effects on the average skill level of the Canadian working-age population, but an interesting and important feature of Canadian immigrant selection policies is that they are already "literacy-oriented" (Vézina, Bélanger, Sabourin et Marois, 2019). Thus, while the composition of the non-Indigenous Canadian population is constantly changing, and the literacy/numeracy gap between them and the Indigenous population appears to be a constant.

Settler colonialism is a structure, not an event, and persists in the ongoing elimination of Indigenous populations, and the assertion of state sovereignty and juridical control over their lands (Barker, 2012).[25] It creates policies for Indigenous peoples without reference to their perspective or their right to self-determination and treats them as a conquered/inferior people that have become a burden of the state. The Newcomer Society of the nineteenth and twentieth centuries' which laid the foundation for many of today's ongoing Indigenous society/Newcomer Society conflicts is summarized in the writings of Duncan Campbell Scott, deputy superintendent, of the Department of Indian Affairs for Canada, 1913 to 1932:

> *I want to get rid of the Indian problem. I do not think as a matter of fact, that the country ought to continuously protect a class of people who are able to stand alone… Our objective is to continue until there is not a single Indian in Canada that has not been absorbed into the body politic and there is no Indian question, and no Indian Department, that is the whole object of this Bill.[26]*

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[25] Also see Global Social Theory, Settler Colonialism https://globalsocialtheory.org/concepts/settler-colonialism/

[26] McDougall, Robert L. "Duncan Campbell Scott". *The Canadian Encyclopedia*, 18 January 2018, *Historica Canada*. www.thecanadianencyclopedia.ca/en/article/duncan-campbell-scott. Accessed 14 June 2022.

3.2 The Data sources for Indigenous/Newcomer Society metrics on learning adult competency and education/training

PIAAC is not the only metric by which researchers examine Indigenous education and labour market outcomes. Calver (2015) uses census data (Census 2001 and NHS 2011), the Aboriginal People's Survey, population growth projections, and forecasts of aggregated economic conditions to assess the economic impact of closing the educational attainment gap between Indigenous people and the Newcomer Society by 2031. He finds that despite improvements between 2001 and 2011, Canada's Aboriginal population continued to under-perform in the labour market. He notes that, on average, "Aboriginal people are less likely to be working than non-Aboriginal people and, if they are working, tend to earn lower incomes" (Calver, 2014). His analysis of 2016 Census data again indicates limited improvements.

Calvert first looks at the absolute educational gap between the Aboriginal and the non-Aboriginal population, and finds that, between 2001 and 2011, very little progress has been made towards closing the gap. In fact, the gap widened from 1.34 to 1.40 from 2001 to 2011, with only the east coast provinces of Newfoundland and Labrador, Prince Edward Island, and Nova Scotia showing improvements. The gap widened considerably in the western provinces and the Territories. In Ontario and Quebec, Calvert's educational gap data suggests modest improvements that are not commensurate with the amount of money and time spent on addressing the gap. Most disconcerting is that amongst the four age groups analyzed, the gap between the Aboriginal population and the non-Aboriginal one was consistently the highest among its youth (age 25 to 43). This Aboriginal age cohort showed little improvement, with a gap of 1.76 in 2001, 1.81 in 2006 and 1.75 in 2011. Calvert's breakdown by First Nation, Métis, and Inuit populations shows that the Métis made more progress towards closing the educational gap between 2006 and 2011, while First Nations and Inuit continued to fall further behind.

However, between the more recent 2006 and 2016 Census comparisons, there is some improvement in First Nations' educational attainment over the decade, with the percentage of First Nation people 15+ years of age that had a university degree rising from 5.2% to 7.4%. This still lags in comparison to the non-Aboriginal population for whom university attainment started at 18.5% in 2006 and rose to 23.9% in 2016. By this metric, the gap in university attainment is not closing.

There are also improvements in other education pathways. For example, when comparing populations that have "No certificate, diploma or degree," First Nation rates dropped from a staggering 48.4% in 2006 to 38.2% in 2016. This compares to 23.1% in 2006 and to

17.6% in 2016 for the Newcomer Society.[27] "Apprenticeship or trades certificate or diploma" has also historically also been a popular education pathway for Indigenous peoples; however, has recently been in decline. In 2006, this education pathway represented 10.4% of the First Nation population, which was favourably compared to the non-Aboriginal labour force (10.8%). However, by 2016, the percentage of First Nation people who had completed a trades certificate or diploma had slightly declined to 9.8%, a drop off also seen in the Newcomer Society (9.7%). The 2016 Census documents the lower on-Reserve educational attainment levels for First Nation people. It shows that 33% of the First Nation population is living on-reserve, and 44% of them held no certificate, diploma or degree. The On-Reserve population is under-represented in secondary certification, college degrees, and in university degrees above the Bachelor level for example at 18.4% compared to the population at large to 33%. They are roughly, equally represented in the apprenticeships and trades and actually slightly overrepresented in university certificate and diplomas below the Bachelor level at 37.7% compared to 33%.[28] Using 2011 NHS data, Calver (2015) estimates that:

> *Closing the education gap would raise Aboriginal employment by ninety thousand workers, GDP by $28.3 billion (2010 dollars) and Aboriginal employment income by $11,236 per worker in 2031. Labour productivity would increase by 0.03 percentage points per year over the 2011-2031 period. Assuming improvement occurs at a constant pace, we estimate that the cumulative gains to Canadian GDP would be as large as $261 billion (2010 dollars) over the 2011-2031 period.*

The potential rewards for Canada of improved Indigenous literacy, numeracy, and problem-solving skills is clearly significant. The question that must be addressed then is, how does one work with Indigenous communities to develop policies and deliver programs that will see them achieve desired literacy and competency goals? The key message from this review is that the solution must be led by the Indigenous community.

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[27] Statistics Canada census categories differ between 2006 and 2016 with the 2006 category used here for comparison being North American Indian, single response, compared to the category First Nation in 2016. See: Statistics Canada - 2006 Census. Catalogue Number 97-560-XCB2006028, Statistics Canada Catalogue no. 98-510-X2016001. Ottawa. Released July 18, 2018.

[28] Statistics Canada, 2016 Census Dictionary defines this category as: University certificates or diplomas (below) are awarded for non-degree programs of study completed through a university. They are often connected with professional associations in fields such as accounting, banking, insurance or public administration. See: https://www12.statcan.gc.ca/census-recensement/2016/ref/dict/pop038-eng.cfm

Next, Calver (2015) looks at the labour market outcomes of Canada's Indigenous and non-Indigenous population. Using Public Use Microdata Files from the 2001 Census, 2006 Census, and 2011 National Household Survey, he shows labour market outcomes for Aboriginal people, looking at absolute gaps in employment statistics and relative gaps.

Calver's custom tabulations allows for labour market data on the Indigeous working-age population of those aged 25-64 years. He combines collated data for the Aboriginal community, rather than recognize the inherent differences between the three Indigenous distinctions groups. Claver modifies the expected weighting of the larger Aboriginal youth cohort 15-23 in the population. The 2016 data that includes the 15-23 group show that impact is actually greater within the non-Indigenous community. This is probably a factor of greater post secondary educational opportunities within the Newcomer Society than the First Nation community (See Figures 4 and 5).

Figure 4: Aboriginal Labour Market Outcomes and Gaps, Ages 25-64, Canada, 2011				
Labour Market Outcome	Aboriginal	Non-aboriginal	Absolute Gap	Relative Gap as a %
Employment Rate	62.5	75.8	13.3	17.5%
Participation Rate	71.7	80.6	8.9	11%
Unemployment Rate	12.8	6	-6.8	-113.3%
Ave. Employment Income*	$50,928	$60,296	$9,368	15.5%
* of full-year full-time workers in 2010, 2010 Constant Dollars				
Calver 2015				

Figure 5: First Nation Labour Market Outcomes and Gaps, 15-64, Canada, 2016				
Labour Market Outcome	Aboriginal	Non-aboriginal	Absolute Gap	Relative Gap as a %
Employment Rate	57.1	65.4	8.3	12.7%
Participation Rate	46.8	60.5	13.7	22.6%
Unemployment Rate	18	7.4	-10.6	-143.2%
Ave. Employment Income*	$51,529	$66,376	$14,847	22.4%
* of full-year full-time workers in 2015, 2015 Constant Dollars				
After Calver, 2015; Coates and Finnegan 2022				

The relative gap between the Aboriginal and non-Aboriginal labour is considerable. The unemployment rate gap was 113.3%, and the employment income differential for full-year-full-time workers was 15.5% (Figure 6). The 2016 data, which provides breakdowns by distinctions, finds that the First Nation labour force fare worse in labour force participation, with a 22.6% gap between them and the non-Indigenous population. There is also a 143.2% difference in unemployment rate, and a 22.4% difference in employment income for full-time workers between the two populations.

| Figure 6: The Increasing Absolute Gap in Average Years of Educational Attainment of the Aboriginal and non-Aboriginal Populations Aged 25- 64 by Select Characteristics, Canada, 2001, 2006, 2011			
Category	2001	2006	2011
First Nations	1.45	1.59	1.63
Métis	1.07	1.14	**0.98**
Inuit	1.84	2.27	2.53
Registered Indian Status	1.47	1.64	1.78
Calver 2015			

Schirle and Sogaolu (2020) note a large body of evidence in Canada that labour market outcomes are related to racial identity. Feir (2013) offers a recent analysis of the earnings of Indigenous people in Canada, pointing to large gaps in annual earnings between First Nations, Métis, and non-minority Canadians. Her study points to the importance of accounting for weeks and hours worked over the year, the importance of characteristics such as education, access to well-paid work, and differences in experience for those on-Reserve and off-Reserve. Pendakur and Pendakur (2002), in studying earnings gaps across ethnic groups in Canada, found that Indigenous people faced the largest earnings gap and that the gap had been increasing over time. These findings are supported by George and Kuhn (1994), Mueller (2004), and Haan et al.,(2020) using a multivariate analysis that conclude that not only do Indigenous people experience a considerable wage gap, but that Indigenous women were even more likely to be paid less for the same work being undertaken by Newcomer Society women. Furthermore, they find that the gender wage gap among Indigenous peoples remains a reality. Indigenous women are economically disadvantaged in certain industries as well as across some occupational skill levels. Indigenous women would clearly benefit from having access to higher-skilled positions.

But the productivity and skills-fit of Canadians in an increasingly digital economy is not just an issue between Indigenous and Newcomer Society. It is also one of a declining Canadian capacity as noted by Lane and Murray (2018). They argue that Canada's poor productivity performance is holding back improvements in its standard of living, including wages. In particular, labour productivity has been virtually stagnant since 2000, based on findings from an analysis of data from the 2011 PIAAC and international economic data from 1970 to 2010. Their data shows that the proportion of adults (aged 16-65) with low literacy skills in Canada (Level 3 and below) is higher than in the Nordic countries, Japan, Austria and the Netherlands, meaning that almost half of Canada's workforce has lower skills than required to perform the peak cognitive demands of 96 per cent of the jobs in the Canadian economy. Schwerdt, Wiederhold and Murray (2020) argue that:

- As increased literacy skills are put to work, productivity growth increases on average by five per cent (5%) and GDP per capita by three per cent (3%) for every 1% (one per cent) rise in average literacy scores.
- There is a bigger economic return to boosting the skills of people with lower literacy levels than those with higher levels.

Figure 7: Proportions of people with recent work experience, in various groups, at each literacy level, 2011
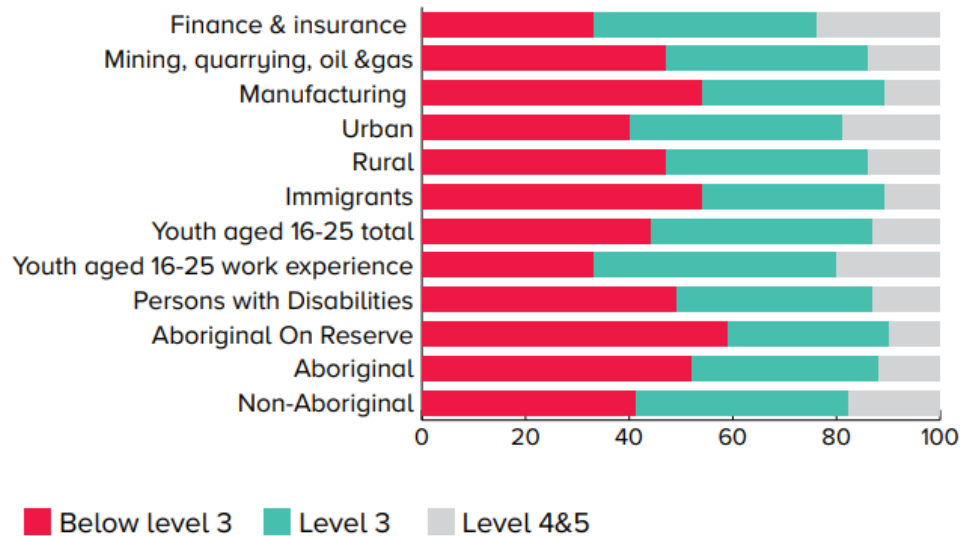
Source: NHS, 2011 with imputed skill scores based on PIAAC, 2011 and ES profiles

Shown in Figure 7, Lane and Murray (2018) also show that specific segments of the Canadian labour force are in greater need: Aboriginal peoples, including those on-reserve, immigrants, persons with disabilities and workers in manufacturing all have lower literacy skills compared to the non-Aboriginal population and workers in professions such as finance. Like Calvert, they argue that government investment in education, in this case – supporting industries in improving the average literacy skills of even a portion of the workforce – would show big returns for both the individuals and for the economy. Lane and Murray conclude that there is a need for economic policy makers to implement

measures that serve to induce employers to increase the knowledge and skill intensity of work so that newly developed literacy skills get utilized at work.

Stijepic (2021) finds that, in more advanced economies, those who are unemployed are less likely to quickly transition to employment if they have low numeracy skills. Stijepic did not find evidence that this relation between skills and unemployment flows extends to less advanced economies included in the PIAAC dataset (Peru, Ecuador, Indonesia, Mexico, Chile, Turkey and Kazakhstan). One must ask, if the Stijepic data was replicated for unemployed people within Canada, would the Newcomer Society score in a similar manner with the numerate population quickly reentering the ranks of the employed while lesser numerate populations such as First Nation workers be less likely to be quickly reemployed?

3.3 The Skills Mismatch Problem and Indigenous Workers

Brunello and Wruuck (2021) define skills mismatch as:

> *at the macro level...the gap between the (aggregate) supply and demand for skills, typically with reference to a specific geographical unit (region, country or country group), and to the fact that observed matches between available workers and available jobs offered by firms in terms of skills and/or qualifications are sub-optimal. At the micro level, skill mismatch occurs when workers have a level of skills that is different from what is required for their job.*

They also note that skill shortages and mismatch vary both with the business cycle and with structural factors (demographic and technological changes, globalization). Skills mismatches can also be seen as being either or both subjective or objective mismatches. Brunello and Wruuck (2021) state, the economic costs of skill mismatch and skill shortages affect individuals, firms and the overall economy. Individual costs include lower wages and poorer skill development. The costs faced by firms comprise of lower productivity, and the hiring and training costs associated with increased job turnover. Aggregate costs include the efficiency losses – in terms of lower average productivity and higher unemployment – associated with the sub-optimal allocation of resources. Bischof (2021) notes additional consequences to skills mismatch such as:

- skill mismatch may also harm non-monetary returns such as job satisfaction,
- Low job satisfaction itself is also claimed to cause a range of negative consequences, such as lower productivity of employees,
- higher absenteeism from work,
- and a higher probability of quitting one's job.

Maslov and Zhong (2022), in their review of the mismatched skills literature, find only two Canadian articles that examine skill mismatch for Indigenous peoples: Calhoun (2015) and Mahboubi (2019). These articles find that Indigenous people are more likely to be under-skilled in numeracy than non-Indigenous Canadian-born people, but not in literacy. In addition, they find that First Nations women are more likely to be under-skilled in numeracy, whereas First Nations men are more likely to be under-skilled in literacy (See Figure 8; this adds an additional layer of nuance.

Given that Indigenous people face various barriers to skills development and educational attainment, they are, on average, less skilled than non-Indigenous people (Mahboubi and

Figure 8: The relative incidence of under-skilling for selected socio-economic characteristics
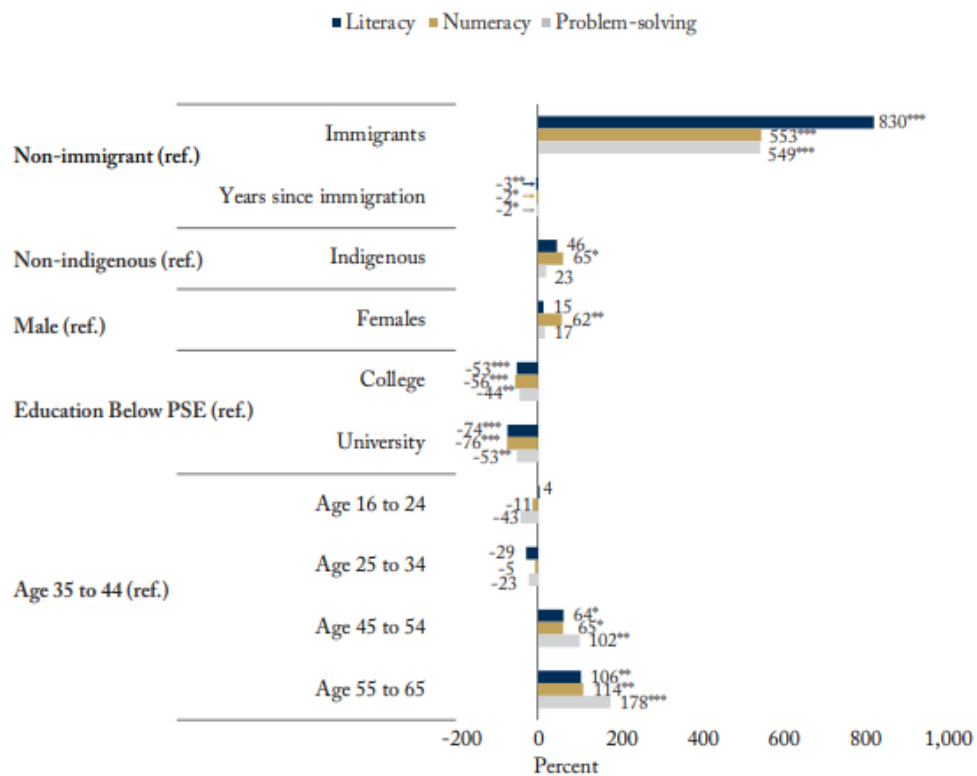
Note: Sample is restricted to employees that work at least 30 hours per week, that are non-apprentices, and are non-students. Numbers show the relative probability of being under-skilled rather than being skill-matched. Incidence of over-skilling for selected socio-economic characteristics are relative to their corresponding group referenced on the far-left side of vertical axis. * significant with 95 percent confidence; ** significant with 99 percent confidence; * significant at 99.9 percent confidence.

Source: Author's calculation using Tables 4.5, 4.6, and 4.7 in Calhoun (2015).

Busby, 2017). It is therefore not surprising to find that they are more likely to be under-skilled for their job. For example, the incidence of under-skilling in numeracy among Indigenous workers is higher by 65% compared to non-Indigenous people.

Figure 9: Identifying Skill-Mismatched Workers (After Maslov and Zhong, 2022)
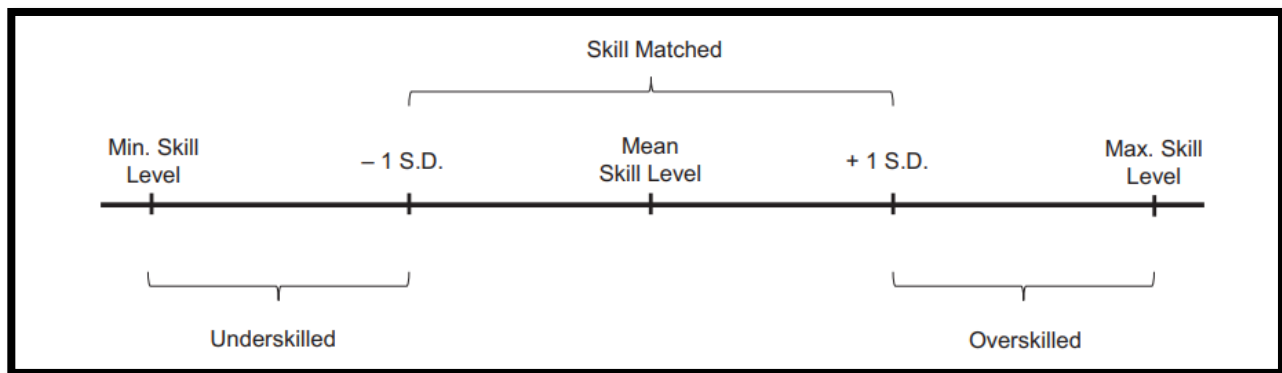
Indigenous men are also more likely to be over-skilled in all skill domains, compared to women (Calhoun, 2015). This is largely mainly due to the former groups' lower technical and applied skill levels, even though they have higher levels of educational attainment than Indigenous men. This ghettoization of women into lower paying, manual labour can also have repercussions on safety and equality fronts. As Saxinger and Gartler (2017) note in their study of the impacts of mining on a Yukon First Nation community: camp managers and company representatives clearly state that in cases of harassment, the perpetrator is fired immediately. However, a female electrician working on-site at Victoria Gold noted that she was subject to criticism by her male peers with comments like "this is not a job for a woman." Another women employee stated: "It's a tricky situation. On the one hand, you should be yourself, and on the other hand you have to adapt to a certain extent to the male environment. They are simply the majority."

Maslov and Zhong (2022) provide another statistical modelling exercise by which they assess First Nation, Métis and Inuit patterns of being over- or under-skilled in literacy and numeracy in their jobs. Using PIAAC data, they found that "First Nations men are almost twice as likely to be under-skilled in literacy than non-Indigenous Canadian-born men, and First Nations women are twice as likely to be under-skilled in numeracy (in comparison with Canadian-born women)". Furthermore, "Inuit men and women are five to seven times more likely to be under-skilled in literacy and numeracy than non-Indigenous individuals". In addition, they find that the estimated gap is larger for under-skilled First Nations women than for higher-skilled First Nations women and for highly-skilled First Nations men than for under-skilled First Nations men (Maslov and Zhong, 2022).

Figure 10: Canada Census 2016, First Nation Total Sex & Age groups, On-Reserve as a Percentage of Total Population				
Topic: Highest certificate, diploma or degree	First Nations Population On-Reserve [1]	Total First Nation Population On & Off-Reserve	On-Reserve as a % of total	On-Reserve Education as a % of Total Population Attainment
On-Reserve: Highest certificate, diploma or degree	227940	691405		33.0%
No certificate, diploma or degree	116910	264430	51.3%	44.2%
Secondary (high) school diploma or equivalency certificate	45480	175315	20.0%	25.9%
Apprenticeship or trades certificate or diploma	21425	67480	9.4%	31.8%
College, CEGEP or other non-university certificate or diploma	28905	117790	12.7%	24.5%
University certificate or diploma below bachelor level	5850	15520	2.6%	37.7%
University certificate, diploma or degree at bachelor level or above	9365	50880	4.1%	18.4%

1) Users should be aware that the estimates associated with this variable are more affected than most by the incomplete enumeration of certain Indian reserves and Indian settlements in the 2016 Census of Population. For additional information refer to the Aboriginal Peoples Reference Guide Census of Population 2016.

Statistics Canada. 2018. Aboriginal Population Profile. 2016 Census, Statistics Canada Catalogue no. 98-510-X2016001. Ottawa. Released July 18, 2018. http://www12.Statistics Canada.gc.ca/census-recensement/2016/dp-pd/abpopprof/index.cfm?Lang=E

Coates and Finnegan, 2022

Maslov and Zhong think that partnerships between the Canadian government and Indigenous organizations may be an important long-term instrument in reducing under-skilling rates among Indigenous populations. However, each policy, institutional reform, and design of targeted educational and training programs (both on-the-job and those tailored to unemployed individuals) should be accompanied by a thoughtful analysis of the systematic barriers to increasing the quantity and quality of culturally appropriate education.

An alternative approach to understanding the mismatch between Indigenous workers (and those unemployed or not in the labour force) may be to assess their educational attainment against the job vacancies that exist in the Canadian job market. Job vacancies in Canada reached an all-time high of 912,600 in the third quarter of 2021, as employers and workers continued to adjust to public health restrictions and rapidly evolving economic conditions. Like other economies recovering from the labour market impacts of the COVID-19 pandemic, record-high job vacancies coincided with growth in overall

employment and falling unemployment.[29] In discussions with staff at Statistics Canada, the authors discussed looking at the vacancies from an Indigenous perspective. This could include the geographic location of the job, the probability of an Indigenous person being spatially aligned with the opportunity, the occupational skill set required for positions, and how those aligned with Indigenous workforce skillsets. Statistics Canada[30] suggests:

> *For both the Labour Force Survey (LFS) and Job Vacancy and Wage Survey (JVWS), we have been using the occupation variables in these databases, in combination with the O*Netdatabase (https://www.onetonline.org/help/onet/ database), to derive insights into shifts in demand for particular skills. For a given level of geography, we can examine whether employment is increasing in occupations requiring particular skills. Similarly, we can address whether the number of vacancies typically requiring a given skills is increasing or declining. Thinking about bringing an Indigeneity lens to this, and thinking about sample size constraints, I would suggest thinking about an 'ecological' approach rather than a person-level approach and I would suggest thinking about using the 2021 Census (labour variables to be released in November 2022) rather than LFS. You could then think about addressing questions like:*

> > *1. Is employment increasing in different occupations (or skills clusters) among Indigenous Canadians than among non-Indigenous Canadians*

> > *2. Is demand for particular skills increasing/decreasing in economic regions with higher proportions of Indigenous population than those with lower proportions?*

> > *3. Are there indications that Indigenous Canadians are migrating towards jobs with particular skills profiles*

These ideas form the basis for a future research project which could provide greater geographic and more detailed insight into the employment mismatch literature. This would not only add a new dimension to the academic literature by providing a spatial underpinning to the Indigenous labour force mismatch, but also allow for better targeting of programs to specific areas where demand and supply do not match. Finally, this

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[29] See Statistics Canada, (2021) https://www150.statcan.gc.ca/n1/daily-quotidien/211220/dq211220a-eng.htm
[30] Vincent Dale, Director of the Center for Labour Market Information, correspondence, January 14, 2022, with Greg Finnegan, vincent.dale@canada.ca

approach would include the on-reserve population for whom significant labour market research is lacking.

Hossain, A. et al. (2021) found that while the number of Aboriginal post-secondary graduates' education was increasing, many of them have jobs that have no connection with the skills they received from their educational institutions. The number of Aboriginal post-secondary graduates increased from 170,520 to 281,765 from 2001 to 2011, for the age group of 25 to 64. As a result, 42% of the Aboriginal working-age population hold a post-secondary certificate or diploma (Statistics Canada, 2011; Gordon and White, 2013). However, many of them do not have relevant jobs available in their geographic location, due to the economic conditions in rural and remote regions and end up accepting lower-level jobs to meet their financial needs.

To enhance students' employability skills, it is crucial to integrate Indigenous contents to learning/teaching contents and context while focusing on basic employability skills such as numeracy and technological aspects and reading comprehension (Hossain, A. et al., 2021). The framework model utilized by Hossain et al. (2021) provides a unique illustration of the different skills sets required for students to move through educational phases to employability, including basic skills, hard skills, and soft skills. Their research, based on a quantitative analysis of Indigenous students at Manitoba's University College of the North (UCN), found that cultural awareness has impacts on employability, but students do not connect it to the required employability skills. Such disconnection of cultural awareness with employability skills justifies the necessity to integrate Indigenous cultural contents into programs and curriculums in today's post-secondary education, particularly in the improving students' cultural knowledge, which, in return, enhances their employability in Indigenous contexts.

Figure 11: Essentials of employability in Aboriginal context
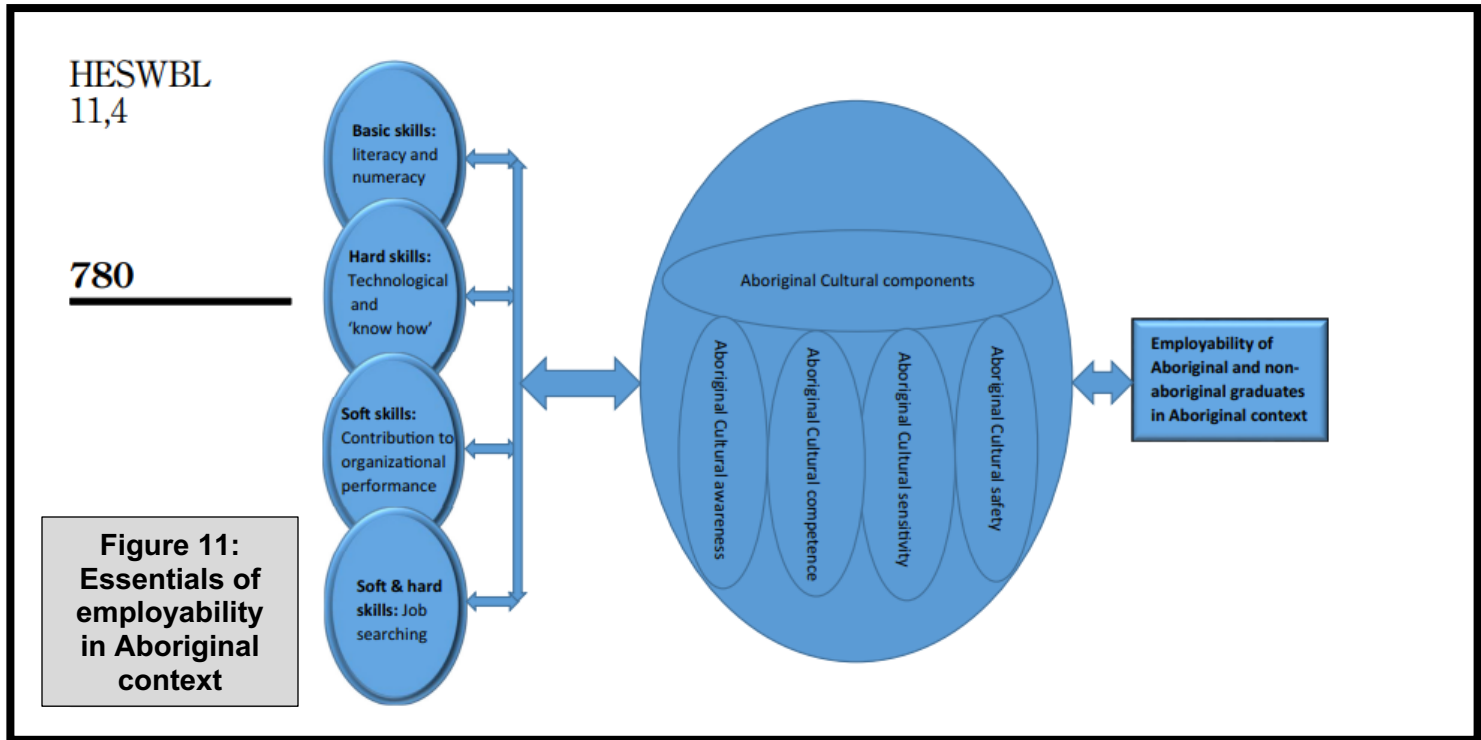
3.4 Digital Agency and Problem Solving

Digital technology is transforming how people, businesses, and governments interact, transact, work, and learn. In response, the World Bank posits that "countries need to foster citizens' acquisition of digital skills through education and training, both formal and informal."[31] Digital Agency (DA) can be defined by three component parts – digital competence, digital confidence, and digital accountability (Passey et al., 2018). Passey et al. take their queue for digital agency from Article 1 of the *United Nations Declaration*

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[31] The World Bank (2022) *Investing in human capital in El Salvador: the knowledge currency of the digital economy,* https://blogs.worldbank.org/education/investing-human-capital-el-salvador-knowledge-currency-digital-economy, accessed June 20, 2022

of Human Rights (1948), ensuring that as we go forward as a global society, driven by digital and other technologies yet to be invented, the individual will always retain her and his ability to control and adapt to accelerating changes in society through the exercise of digital competence, digital confidence, and digital accountability. Like the World Bank, the authors argue that Digital Agency is a fundamental requirement for and through education that must be enabled through ongoing and developing digital practices.

As such, digital agency is also becoming ever more significant for Indigenous communities. For example, Holcombe and Kemp (2019) conclude that automation and robotics and transforming the nature of work in the renewable resources sector where there is high Indigenous participation, and there are implications for the Indigenous workforce. In mining, for example, they find that in the past two decades, the number of Indigenous employees in the mining sector has grown to unprecedented levels as a result of local level agreements, state regulatory requirements, and mining company policies and commitments. Yet, the predicted acceleration in mine automation could disrupt this positive trend, as automation targets entry level and low skill level jobs which are disproportionately where Indigenous peoples are employed in manual and semi-skilled roles. There is little indication that the industry is considering the potential downside effects of mine automation. They believe that a careful and critical examination of mine automation and its effects on Indigenous peoples is urgently required. Coates (2020) echoes these concerns.

Speaking to a conference of mining executives in Nunavut, Coates (2018) states: "You do not just train people for jobs tomorrow. You have to have someone to drive that truck. But you had better train people for the jobs of 2030. The people you are training today as 18-year-olds, in 2030, will be in their early 30s, they'll be building a family. If your plan is to get rid of those jobs through automated trucks, make sure those people are trained for the next generation of work."[32]

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[32] Quoted in "Inuit must lead Development," *The Nunatsiaq Times*, April 11, 2018
https://nunatsiaq.com/stories/article/65674ken_coates_inuit_must_lead_nunavut_mine_development/
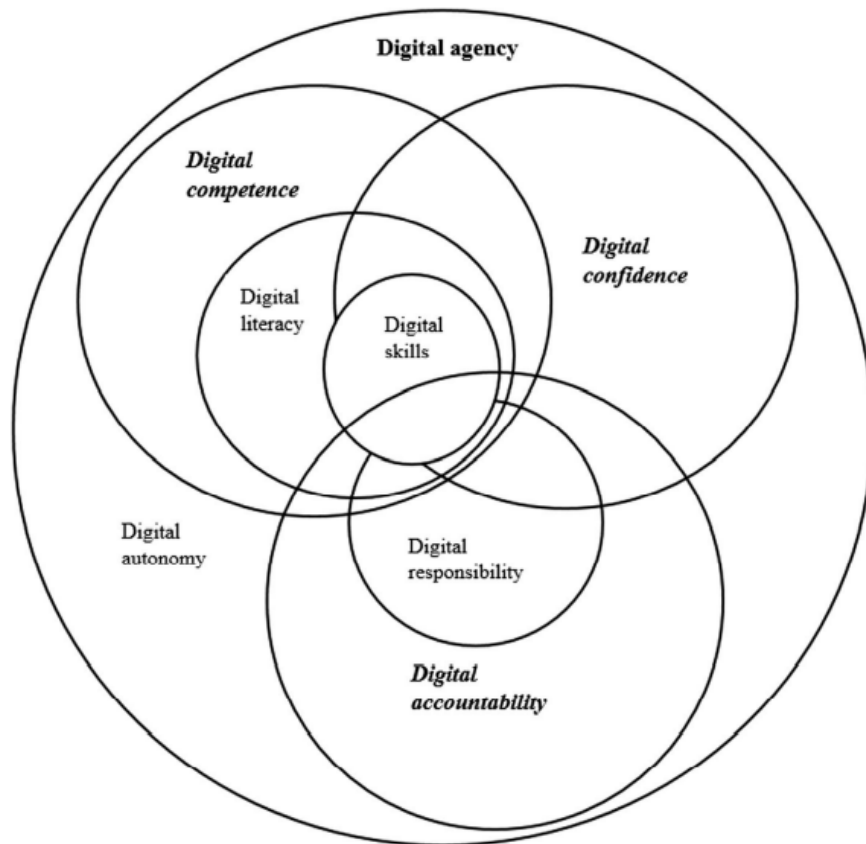
Figure 12: Proposed relationship of terms related to digital agency

The Canadian Council for Aboriginal Business (CCAB), in a 2020 review of the digital business environment and the vulnerability of Indigenous businesses to technological change, found that:

> *By industry, Indigenous employment is more concentrated in the top five industries at high risk from automation (accommodation and food services; retail trade; construction; transportation and warehousing; and management, administration and other services) relative to non-Indigenous employment in Canada.*

They also reported that Indigenous workers in Nunavut, British Columbia, Prince Edward Island, the Northwest Territories, Ontario, and Alberta are more at risk from automation than non-Indigenous workers in these provinces. While people working in senior level management jobs are much less likely to lose their job in automation risk predictions, workers in jobs requiring minimal educational qualifications are most likely to lose them.

Coates and Holroyd (2022) see the North, and this includes broad geographic swaths of Indigenous communities, as having limited opportunity to participate in the new digital age. The solution, CCAB posits, "will require greater collaboration between all tiers of government, the private sector, and Indigenous leadership and community-based organizations. First, educational reform must focus on delivering high-quality and culturally appropriate curricula and resources to both urban and remote reserves and ensure that Indigenous youth living on, and off-reserve have access to educational opportunities on a par with non-Indigenous Canadians. The OECD report, 'Students, computers and learning' (2015), shows the importance of traditional literacy and numeracy as a precursor to digital competence. The report states that at school, basic literacy and numeracy are more important for (future) digital equity than access to advanced technology and internet services; indeed, traditional literacy and numeracy pave the way for knowledge acquisition. The World Bank also sees digital technologies as transforming how people, businesses, and governments interact, transact, work, and learn. They posit that: "to increase the adoption of digital technologies, countries need to foster citizens' acquisition of digital skills through education and training, both formal and informal."[33] As part of their international skills foundation program they are investing in digital learning in Africa and Latin America to boost digital competency. Next, it will be key to increase digital connectivity in Indigenous communities. Despite significant investments by the public and private sectors to support broadband deployment, access to high-speed internet is lowest in rural and remote areas and continues to lag behind for minority groups including the Inuit and First Nations peoples (Office of the Auditor General of Canada, 2018).

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[33] The World Bank (2022) *Investing in human capital in El Salvador: the knowledge currency of the digital economy,* https://blogs.worldbank.org/education/investing-human-capital-el-salvador-knowledge-currency-digital-economy, accessed June 20, 2022

Digital connectivity differs among Indigenous groups according to their geographical location and group age. Most Métis (93% in 2017) have access to the internet at home. A lower share of Métis in rural areas have

Figure 13: Digital Connectivity

Persons aged 15 and older

	Percentage population with access to home internet (total)	Percentage population accessed internet on wireless device in the past month
Métis	93	81
First Nations off-reserve	90	79
Inuit	75	73
Canada (total population)	86	n/a

Sources: Statistics Canada (2018[29]), *Labour Market Experiences of Métis: Key Findings from the 2017 Aboriginal Peoples Survey*, https://www150.statcan.gc.ca/n1/pub/89-653-x/89-653-x2018002-eng.htm; OECD (2017[63]), *OECD Digital Economy Outlook 2017*, https://dx.doi.org/10.1787/9789264276284-en.

internet access at home (88%) compared to those in small (93%), medium (94%), and large population centers (95%). Across Canada, home internet access among Métis was higher in BC (96%), than in Quebec (89%), the Northwest Territories (90%) and Saskatchewan (90%). Access also varied across age groups as 98% of young Métis had internet access, compared to 95% of core working age Métis and 86% of older Métis (Statistics Canada, 2018). While data from the Aboriginal Peoples Survey indicates that the percentage of the population with access to home internet is higher for Métis and First Nations off-reserve than that of Canada overall, this figure should be interpreted with caution as it does not account for the quality of the bandwidth. For example, groups such as the First Nations Technology Council in British Columbia report that 75 percent of First Nations communities in British Columbia do not have adequate internet (e.g., they are unable to download a pdf attachment in an email due to slow connectivity) (First Nations Technology Council, 2018).

A systemic review of 25 empirical studies focused on computer literacy and Indigenous people by Li, Brar, and Roihan (2021) examines the evidence for the efficacy of using digital technologies to support Indigenous people's learning of language and literacy skills. Their review covers empirical research projects in Canada, Australia, Latin America, Malaysia, Taiwan, and the USA that test the development of teaching and learning strategies by leveraging digital technology. They find that young people are early adopters of new technologies, and educators should develop innovative language and literacy instruction using technology and encourage Indigenous students to integrate their learning of language and literacy skills with their increasing use of social media and technological devices. An issue that comes up repeatedly in the research is the need for culturally sensitive content that not only reflects Indigenous society, but is generated by them – e.g., the development of Indigenous people's multiliteracies, a combination of digital literacies with reading and writing skills. Li, Brar and Roihan conclude that community and land-based educational programs (what they refer to as multimodality) have a better chance of success than traditional western models of education. They argue that these approaches would improve language and literacy and technological skills while also strengthening the students' sense of being Indigenous.

They also found that web-based learning tool, appeared effective in early literacy development using ICT and feasibility in the classroom, although based on the finding of only four reported studies.[34] They conclude that: "use of these digital technologies is intrinsically self-motivated, which researchers and educators can leverage to support Indigenous people's effective learning of language and literacy skills." Third, organizations that employ many Indigenous people have an obligation to anticipate industry trends that may put segments of their workforces at risk of automation and implement an upskilling program to help retain Indigenous workers. This program should measure core skills and competencies and then develop a strategy to address current and future skills deficits. Education and training programs designed for Indigenous people of all ages and educational backgrounds must be sensitive to historical and cultural differences (CCAB, 2020). One example of such a program is the World Bank's international skills foundation program in which they invest in digital learning in Africa and Latin America to boost digital competency. The World Bank's digital learning methodology focuses on six pillars for an inclusive digital economy - Digital Infrastructure, Public Digital Platforms, Digital Financial Services, Digital Businesses, Digital Skills, and Trust Environment. Their program in Latin America stresses technical and digital skills learning in the last two years of high school followed by a year of expertise at a technical institute supplemented by private sector training programs whereby social enterprise organizations offers boot camps, short and accelerated courses co-created with companies hiring these skills, especially in creative technologies sectors.

3.5 Statistical Data and the understanding of Indigenous educational and economic engagement.

As shown in the research studies covered thus far, Western and Newcomer Society's research tends to build on abstract numeracy and often presents bureaucratically and impersonally; this does not always connect well with Indigenous worldviews (Finnegan, 2012). Newcomer society's focus on numeracy and the need for abstraction are part and parcel to the western socio-political experience and reduces individual experiences to ones and zeros to comply with reports upon which policy is generated, and funds and resources distributed.

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[34] See: A Balanced Reading Approach for Children Always Designed to Achieve Best Results for All (ABRA), a web-based literacy programme developed by the Centre for the Study of Learning and Performance (CSLP) at Concordia University. See; https://literacy.concordia.ca/resources/abra/teacher/en/

Another perspective on Newcomer Society statistics is provided by Walters (2016). She defines western studies on Indigenous communities as being caught up with the "5-Ds" – disparity, deprivation, disadvantage, dysfunction and difference. Much of the statistical research previously presented are pinned to these 5-Ds. Walters recognizes that numbers and data can also be tools of colonialism. Accepting that numbers exist, as a philosophical premise is conceptually different to accepting that numbers have a fixed reality. In Indigenous society and statistics, the question is not just are these numbers real but also how are these numbers deployed and whom do they serve? Although some authors recognize the limitations of the data, they rarely call into question the logic of their research, with a target audience of government or academia, rather than the Indigenous communities that they are studying. A Canadian perspective is provided by Shawn Wilson, a Cree researcher from Manitoba living in Australia, who provides an Indigenous, cross-cultural perspective on research: "Indigenous research is the ceremony of maintaining accountability to these relationships. For researchers to be accountable to all our relations, we must make careful choices in our selection of topics, methods of data collection, forms of analysis and finally, in the way, we present information.*"[35]

Núñez argues that, although ubiquitous in the industrialized world, numerical cognition should not be taken at face value. The answer to the question of what it takes to move from quantical[36] to numerical cognition may be significant. He continues:

> *Healthy humans from cultures who speak Indigenous languages do not traditionally have writing practices and do not carry out exact calculations. They live lives with imprecise quantities, and essentially without exact numbers and arithmetic, presumably as humans without explicit training have done successfully for tens of thousands of years. The study of small-scale hunter-gatherer or subsistence-farming groups reveals that the development of numerical notions (when they exist) is, contrary to claims focused exclusively on individual psychology, inherently cultural – a cultural trait. An industrial-centric view of humanity downplays, or even neglects, the crucial implications of this fact: humans do not innately (i.e., without cultural mediation) manifest a specific capacity for generalized exact quantification, namely number.*

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[35] Shawn Wilson (2008), Research is Ceremony, Halifax and Winnipeg, Fernwood Publishing

[36] Quantical: pertaining to quantity related cognition (e.g., subitizing) that is shared by many species, and which provides BEPs for numerical cognition and arithmetic, but is itself not about number or arithmetic. Quantical processing seems to be about many sensorial dimensions other than number, and does not, by itself, scale up to produce number and arithmetic.

The fact is that many isolated cultures without scholastic traditions speak languages that have very limited numeral systems (i.e., they have a number lexicon and expressions that can only designate quantities within or around the subitizing range) and do not entertain exact and categorically distinct number concepts such as our familiar 'seven' or 'nine.' Contrary to reports that these cases are uncommon, a recent survey of 189 Aboriginal Australian languages reported that 139 (74%) have an upper numeral limit of only 'three' or 'four', and an additional twenty-one languages (11%) have a limit of 'five'. Another survey, analyzing 193 hunter-gatherer languages from different continents, found that most of these languages have an upper limit of 'five' or below (61% in South America, 92% in Australia, and 41% in Africa) with some languages, such as the Amazonian Pirahã and some Yanomami languages, as well as some Australian languages, have been reported to have a limit of only 'two'. Importantly, beyond this low limiting numeral range, all these languages designate quantities with natural quantifiers – such as the English 'several' and 'many.'

Núñez (2017) is exploring the cognitive sciences behind language and numeracy in the Indigenous/Settler dichotomy. If he is correct, then the gap that Calvert (2015) explored has its origins in thousands of years of socio-economic development which differentiates the Indigenous experience and the European settler experience. Walter (2021), an Aboriginal Australian researcher, questions the logic of Newcomer Society data and its control and use by the state. She believes that such numbers are used to reinforce dominant discourses about Indigenous peoples and, in so doing, they support the status quo of the subordinate Indigenous position within the nation-state (Taylor, 2016). Walter et al. (2020) echoes these sentiments. They see "government data and Big Data as not reflecting Indigenous realities, nor providing the requisite data resources for Indigenous communities and First Nations to fully participate in determining our own futures. What they do reflect is the state-preferred mode for the administrative ordering of an Indigenous sub-population. And they are powerful. How the state "sees" its Indigenous population/s is the data lens by which Indigenous Peoples are made visible. It defines who and what Indigenous Peoples are, and who and what we are not; it delineates what can be seen and, more critically, what the state refuses to see".

A similar theme is espoused by Blue and Pinto (2017) in a review of financial literacy education programs (FLE) in Canada. The aim of conventional FLE approaches focuses on how individuals need to be financially aware and responsible for their financial futures. Packaging financial literacy skills and knowledge as easy-to-acquire is of great concern, especially for vulnerable and/or marginalized individuals. They recommend that FLE programs move towards a more holistic approach which involves moving away from the one-size-fits-all curricula, and including economic/financial and social justice teaching, recognizing that wealth accumulation may not only be beyond many lower income Indigenous families, but also that the western concept of "individual wealth accumulation focus of budgeting and saving are contrasted with a 'rich' life which in some Indigenous

communities, is often more about having strong family relations, access to food and accommodation" – concepts that stress collective behaviour and sharing.

The research papers and organizational reports interpreted in this study almost all have a common dependency on large data sets collected, administered, and controlled by government agencies and organizations such as Statistics Canada, the Australian Bureau of Statistics, the OECD in Paris, and various departments of education at the provincial and state levels all of which are western administrative bodies. The question must be asked: Can Indigenous communities develop metrics to, if not counter the government's Big Data, then at least moderate or place an Indigenous perspective on information related to education and knowledge, employment and skills, and income and governance which ameliorates the tendency of newcomer-society statistics to be so dominated by the 5-Ds? Various Indigenous organizations and academics like Walters et al. in Australia, Rowe in Canada, West in New Zealand, and Carroll in the USA are striving to develop a new model of Indigenous data sovereignty. In Canada, the First Nations Information Governance Centre created OCAP principles (ownership, control, access and possession) to provide a standard for the collection and use of statistical data relating to Indigenous peoples. This is an issue that Paul (2019) contends is essential given that narratives from current large-scale data based often share the same messages of oppression so consistently that it reshapes marginalized groups' realities and weakens their abilities to overcome hardships.

3.6 *Programme for the International Assessment of Adult Competencies* (PIAAC)

In 2013, *the Programme for the International Assessment of Adult Competencies* (PIAAC) published its first round of comparative analysis on the three foundational skill sets of Canadians relative to other countries. The data also compares provincial and territorial scores against those of Canada and other states.

Figure 14: PIAAC Sample Distribution (Draft, November 10, 2010)				
Territory	General Sample (national + PT	Aboriginal Population	Total Sample	IALSS Total (2003)
Yukon	450	450	900	1,092
NWT	450	450	900	818
Nunavut	180	700	880	677
Territories only	1,080	1,600	2,680	2,587
Source: Yukon Bureau of Statistics, Nov. 1, 2010. G.F. Finnegan to Sylvie Grenier, Manager PIAAC Statistics Canada.				

Of considerable interest is the new PS-TRE measure that was introduced in 2012, which provides a measure of the ability of people to operate in a *Problem-Solving Technology-Rich Environment*.[37]

Unique to the 2013 PISA survey coverage was that Canada emphasized increasing sample sizes in its Northern Territories to better represent and differentiate the skills of Aboriginal and non-aboriginal people, as well as to be able to examine each territory separately. All too often, Canadian surveys report on the three territories as an Arctic block as a result of small sample sizes Thus, in 2010, Yukon took the lead on "up-sampling" the Indigenous population in the North, working with Statistics Canada and the Canadian Northern Economic Development Agency (CanNor). At the time, Yukon and NWT both had a sample size of 450 each, and Nunavut only had a sample size of 180 (Figure 14). Through a funding arrangement with Canada, the territorial samples were raised by an additional 450 Indigenous people each in the Yukon and NWT, and by 700 in Nunavut, creating a much richer database. At this time, it is unknown if the PIAAC data on Canada's Northern Territories has been fully explored using this geographic and topped-up foundation. The Canadian Territorial PIAAC data might also be a viable proxy for on-reserve studies, and providing a baseline for remote community analysis, although there may still be an "urban" bias due to the large Indigenous populations in Whitehorse, Iqaluit, and Yellowknife.

One of the most notable findings of the PIAAC report is that between 2003 and 2012, a lower proportion of Canadians attained Level 4 or 5 literacy and numeracy, with a higher proportion operating at Level 1 or lower. Relevant comments from the PIAAC report are provided below:

While educational outcomes for [Canada's Aboriginal population] is improving, a high proportion of those aged 16 to 65 have no certificate, diploma, or degree: just over a quarter in Ontario and British Columbia; about a third in Manitoba, Saskatchewan and Yukon; almost half in Northwest Territories; and two-thirds in Nunavut. In comparison, the proportions of non-Aboriginal people aged 16 to 65 in

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[37] Statistics Canada: Skills in Canada: First Results from the Programme for the International Assessment of Adult Competencies (PIAAC) Tourism and the Centre for Education Statistics Division Main Building, Room 2001, Ottawa, K1A 0T6, Catalogue no. 89-555-X ISBN 978-1-100-22678-1

the same provinces and territories who had no certificate, diploma, or degree varied from 6% in Nunavut to 17% in Manitoba (NHS, 2011).

In Manitoba, Saskatchewan, the Northwest Territories and Nunavut, however, there is a notable difference at both high and low [education] levels. Fewer Aboriginal people than non-Aboriginal people record scores at Level 4 or 5, and many more record scores at Level 1 or below; in the three territories, the proportions at the lowest levels are at least three times higher than for the non-Aboriginal population.

The average numeracy score for the Aboriginal population across Canada is 244, whereas the score for the non-Aboriginal population is 266 [Figure 15]. In all the seven provinces and territories oversampled, Aboriginal populations' score lower than their non-Aboriginal counterparts, but these differences vary considerably. Among the four provinces, the difference ranges from fifteen points in Ontario to 35 in Saskatchewan; in the territories, the difference is more than 50 points. Within each province and territory, the difference is slightly larger for numeracy than for literacy.

While Canada scored above the OECD average in literacy, it fell below the average in numeracy, but was above the average in PS-TRE. Within Canada, considerable variance occurs: Canada has a higher proportion of its population at the highest levels of proficiency in PS-TRE than the OECD average, but also has a higher proportion of its population at the lowest proficiency levels the three categories of literacy, numeracy and PS-TRE. The PIAAC data also provides a breakdown by Aboriginal identity and shows that the Aboriginal population has strikingly low literacy, numeracy, and technology competency scores.

Figure 15: Composite PIAAC Average Scores Northern Saskatchewan, Canada and the OECD, 2012			
Region	**Literacy Average Score**	**Numeracy Average Scores**	**PS-TRE Average Level 1 or below and non-respondents**
OECD Countries	273.3	269.4	66
Canada	273.5	265.5	57.4
Yukon	277.2	263.1	64.3
NWT	253.3	239.4	71.7
Nunavut	219.1*	200.5*	88.2
Aboriginal Saskatchewan	248.2	231.6	78.7
Source: Statistics Canada: Catalogue no. 89-555-X ISBN 978-1-100-22678-1 Skills in Canada: First Results from the Programme for the International Assessment of Adult Competencies (PIAAC) Skills in Canada: First Results from the Programme for the International Assessment of Adult Competencies (PIAAC).			
*Lowest scores in OECD PIAAC Test, 2012 Finnegan and Coates, 2022			

The findings for Aboriginal Saskatchewan are particularly alarming. In Saskatchewan, 32.6% of the Aboriginal population are operating at Level 1 or below in literacy, compared to 16.2% of the non-Aboriginal population. Having a Level 1 in a skill means that individuals can undertake

tasks of limited complexity, such as locating single pieces of information in short texts in the absence of other distracting information. Those categorized as "below Level 1," do not command these skills. They demonstrate only basic vocabulary, as well as the ability to read brief texts on familiar topics to locate a single piece of specific information. The situation is even more problematic in regard to numeracy: 45.2% of the Aboriginal population were Level 1 or below. For the non-Aboriginal population, this figure was 22.1%. This means that they have the skills to perform simple mathematical operations involving a single step, such as counting or ordering. Those categorized as "below Level 1" means they can cope with very simple tasks placed in concrete, familiar contexts where the mathematical content is explicit and requires only simple processes.

What these competency scores mean for the future of labour in Northern Saskatchewan, which has an 86% Indigenous population, is worrying. There will be a continuing, if not growing, need to fly-in skilled, semi-skilled and even unskilled labour to operate the mines, to undertake mineral exploration, and to manage and run the government and businesses. A study by Finnegan (2014) indicates that rather than help employ more Nunavut labourers, there appears to be more Nunavut residents being added to the ranks of the unemployed and the not-in-labour force (NILF) as the number of Interprovincial Receiving (I-P) Employees (Read Fly-In/Fly-Out workers) increases. The local workers available just do not match the skills required, and at the core of this mismatch are the gaps indicated by the PIAAC in literacy, numeracy and problem-solving.

A literature review and environmental scan will help address the *foundational and transferable skills* knowledge gap that currently exists between the Indigenous population in Canada and the non-Indigenous/Newcomer Society. Italics have been used above to highlight *foundational and transferable skills*, as these need some elaboration and context. Indeed, the PIAAC reports provide considerable context on the topic of foundational skills, which are the premise of their internationally comparative testing and reporting program. *Foundational* skills are defined by PIACC:

> *"[...]in terms of three parameters: content, cognitive strategies, and context. The context defines the different situations in which each of these skills is used, including professional, educational, personal, and societal. The content and cognitive strategies are defined by a specific framework that describes what is being measured and guides the interpretation of results (OECD, 2012)."*

- Literacy is defined as "understanding, evaluating, using and engaging with written texts to participate in society, to achieve one's goals, and to develop one's knowledge and potential" (OECD, 2012, p. 19).

- Numeracy as "the ability to access, use, interpret and communicate mathematical information and ideas, in order to engage in and manage the mathematical demands of a range of situations in adult life" (OECD, 2012, p. 33).
- Problem Solving in Technological-Rich Environments (PS-TRE) domain, respondents are measured for their ability to use "digital technology, communications tools, and networks to acquire and evaluate information, communicate with others, and perform practical tasks" (OECD, 2012, p. 47).

The Programme assigns scores for each foundational skills:

- The population of adults aged 16 to 65 was assessed over a continuum of ability in literacy using a measurement scale ranging from 0 to 500. Proficiency levels are used to help interpret the findings. OECD has divided reporting scales for literacy into five proficiency levels (with an additional category, "below Level 1"), defined by a particular score-point range, where each level corresponds to a description of what adults with particular scores can do in concrete terms.
- The population of adults aged 16 to 65 was assessed over a continuum of ability in numeracy using a measurement scale ranging from 0 to 500. As is the case for literacy, the results for numeracy are presented either as an average score or as a distribution across proficiency levels.
- PS-TRE proficiency scale was divided into four levels associated with test participation and a fifth categorization for those survey participants who non-respondents including those individuals who did not report previous computer experience, did not pass the information and communications technology core test, or opted not to be assessed by a computer-based test.

The World Bank also advocates for foundational skills as the base for economic development noting that the learning crisis is not a result of COVID-19; rather, the pandemic has only made it worse. They estimate that before the pandemic, 53% of children in low- and middle-income countries were living in Learning Poverty, that is, they were unable to read and understand a simple text by age 10.[38] By the time the pandemic is over, learning poverty will probably rise by at least 10 percent points due to the impacts of school closures, lost learning hours, and increased dropout rates.

The World Bank argues that "without foundational learning, students often fail to thrive later in school or when they join the workforce. They do not acquire the human capital

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[38] The World Bank, (2022) The urgent need to focus on foundational skills, https://blogs.worldbank.org/education/urgent-need-focus-foundational-skills

they need to power their careers and economies once they leave school, or the skills that will help them become engaged citizens and nurture healthy, prosperous families. As a major contributor to human capital deficits, the learning crisis undermines sustainable growth and poverty reduction."[39] Literacy is a building block to political and economic stability. Although some 260 million children are not even in school, the World Bank found that despite the barriers confronting girls in some areas of education, in virtually all countries for which there is data, girls have lower rates of learning poverty than boys.

Globally, foundational skills are a major policy concern for international aid agencies, for economic development agencies and banks, for local and national governments and, in all probability, for families as they seek to live prosperous and sustainable lives. Given this level of concern and attention governments struggle to provide basic levels of literacy and numeracy to so many children and families in Canada, and especially in Indigenous communities. As Brassington (2022) states in the conclusion to her groundbreaking study on the educational barriers facing the nomadic Gypsy, Roma and Travellers in Great Britain where just 6.3% of Gypsy / Roma and only 3.8% of Irish Traveller students access higher education[40]:

> *"Access to education is a universal right. While higher education may not be the best path for everyone to follow, every student should have the right to make an informed choice about their future. We need to level the playing field: every student must be equipped with the resources they need to pursue the best path for their future."*

3.7 Connections & Discontinuities: The Data, the Literature, and Labour Force Outcomes

The *Arctic Human Development Report* (2015) notes that higher education attainment is associated with greater labour force participation and lower probability of unemployment. The report argues that schooling has a role in reducing poverty and in providing the means for economically disadvantaged groups to improve their standard of living. The

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[39] The World Bank, (2022) *Learning Poverty* https://www.worldbank.org/en/topic/education/brief/what-is-learning-poverty; accessed June 28, 2022

[40] We feel that is it important to recognize that "indigeneity" can include these traditionally "nomadic" people of western Europe who in many ways culturally resemble/parallel the Indigenous experience of North American, Australian and New Zealand First Nations.

completion of university is the most financially rewarding in terms of improved earnings of Indigenous Canadians, followed by the completion of a non-university post-secondary education (Hossain and Lamb, 2012). Returns in education were particularly high for Indigenous residents in Saskatchewan, where the lifetime earnings of an Indigenous male were found to increase by 38% if a university degree was completed, and by 59% for Indigenous women. Investments in education also benefit the competitiveness of national and regional economics, with increases in overall productivity by as much as 5% per additional year of schooling (De la Fuente and Ciccone, 2002).

A key sector with regards to Indigenous employment is Canada's forestry industry, particularly in Northern Saskatchewan/Saskatchewan Far North is a region that is almost 85% Indigenous, with large First Nation reserves, as well as Métis-dominated villages and towns scattered across the boreal forest. A recent study by the Conference Board of Canada (2021) reviews the positive and negative aspects of forestry industry in the region. They acknowledge that:

> Indigenous forestry businesses work hard to bring community members into the forestry business. But local workers are often not interested in harvesting jobs, which require risky physical work in remote locations, or in starting businesses that require a large investment in equipment. It is also hard to find community members who have higher professional and management skills. Relevant degree programs are only available in other regions or provinces and require senior-level math and science courses.

The report recognizes the skills gap that exists between the industrial demand and the Indigenous skills supply. They find that the Far North communities have a strong stake in the skills development ecosystem across the north, but that the current ecosystem does not offer all the skills training needed.

The skills gap is readily apparent in Figure 16, which documents Indigenous forestry jobs in the region by National Occupational Category (NOC) Skill Level. The NOC Skill Level ranges from:

- Skill level A jobs which are those which generally require a university degree.
- Skill level B jobs which generally require several years of higher education or apprenticeship training (usually at least 3 years).
- Skill level C jobs which generally require a high school diploma or a short course, or on-the-job training of up to 2 years.

- Skill level D jobs which generally require only a short amount of on-the-job training. [41]

An Anecdote from an Indigenous Hiring Practice

Around 2009 the Yukon Bureau of Statistics started a practice of using oral exams to select First Nation interviewers for our numerous surveys, one of which would in time be PIAAC. The Bureau wanted to have at least one First Nation staff member on each of our in-person survey teams that worked in the First Nation communities. Traditionally, staff selection was through submission of a resume and then a written exam, but this did not work with First Nation candidates. Many of the candidates were middle-aged women, many of whom may not have graduated secondary school. The survey manager decided to run oral exams where the candidate was given time to read the survey and then ran the survey in the coffee room with the manager as the interviewee, just like in real survey mode. This improved First Nation staffing levels and probably also increased our First Nation response rates. This approach removed the barrier of written exams in a sterile classroom and allowed for tea and bannock interview sessions to open the doors to success.

An Anecdote from an Indigenous workplace

Two short anecdotes provide insight into the undocumented workplace issues Indigenous people face.

A First Nation development corporation had an excellent wildland firefighter who wanted to be promoted to crew chief. He had years of experience and was respected by his colleagues. However, when sent out to Edmonton on two separate courses for crew chief training, a couple of years apart, he failed on both occasions to sit the required written exam. His anxiety regarding exams was just too high and he ended up leaving the fire service. The firm lost an excellent, skilled firefighter, he lost his career, the community may have lost a future leader. The First Nation could not work around this situation as the exams and certification are set by a national organization which is Settler Society driven and as they found out in other business dealings highly protective of their predominately white, male labour membership.

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[41] For National Occupation Category see: https://www.canada.ca/en/immigration-refugees-citizenship/services/immigrate-canada/express-entry/eligibility/find-national-occupation-code.html

Figure 16: Indigenous Participation in Forestry Occupations

Table 1

Indigenous participation in forestry occupations in Northern Saskatchewan and Prince Albert Regions

(2016 Census)

Occupation	Total employed	Number First Nations identity	Number Métis identity	Per cent Indigenous	NOC skill level	Job openings (all SK) 2019–2023
Transport truck drivers	3,100	375	360	24	C	3,220
Heavy-duty equipment mechanics	625	35	25	11	B	410
Construction millwrights and industrial mechanics	560	50	65	22	B	380
Manufacturing managers	175	10	15	17	A	390
Silviculture and forestry workers	165	115	30	91	C	20
Logging machinery operators	140	35	15	39	B	30
Chainsaw and skidder operation	115	55	10	61	C	30
Labourers in wood, pulp, and paper processing	105	30	10	38	D	30
Forestry technologists and technicians	100	0	20	20	B	20
Sawmill machine operators	90	10	10	22	C	30
Supervisors, logging and forestry	65	25	0	54	B	20
Logging and forestry labourers	55	20	15	55	D	30
Forestry professionals	50	0	0	0	A	na
Total	**5,345**	**760**	**575**			**4,610**

Sources: The Conference Board of Canada; Statistics Canada; Mining Industry Human Resources Council; Government of Saskatchewan.

The original Appendix from their report is reproduced in Figure 17 below, with a reinterpretation of the numbers to better document the inequality of hiring that is occurring.

Figure 17: Indigenous Participation in Forestry Occupations Northern Saskatchewan					
Occupation	Total Employed	Indigenous	Non-Indigenous	Indigenous workforce as a %	NOC Skill Level
Forestry Professionals	50	0	50	0.0%	A
Manufacturing Managers	175	25	150	14.3%	A
HD Equipment Mechanics	625	60	565	9.6%	B
Forestry Technologists &Technicians	100	20	80	20.0%	B
Construction millwrights and industrial mechanics	560	115	445	20.5%	B
Logging Machinery Operators	140	50	90	35.7%	B
Supervisors, logging and forestry	65	25	40	38.5%	B
Sawmill machine operators	90	20	70	22.2%	C
Transport Truck Drivers	3100	735	2365	23.7%	C
Chainsaw and Skidder operation	115	65	50	56.5%	C
Silviculture & forestry workers	165	145	20	87.9%	C
Labourers in wood, pulp & paper	105	40	65	38.1%	D
Labourers in logging and Forestry	55	35	20	63.6%	D
Totals	**5295**	**1335**	**3960**	**25.2%**	
By authors, after, Conference Board of Canada 2021 *Saskatchewan's Forest Sector Future Skills for an Indigenous-Led Revitalization,* Appendix C					

By re-sorting the data based on the hierarchical NOC Skill Level categories, one can see that Indigenous workers are disproportionately in the lower skilled and lower paying NOC Skill categories C and D (see Figure 18). Indigenous workers in the forestry sector occupy almost 50% of the Category D positions. Meanwhile, only 11.1% of Category A positions are held by Indigenous workers, while their representation in Category B occupations rises to 18.1%. An equal representation of Indigenous peoples with skills in the region would require an Indigenous employment rate of 87.4%.[42]

Figure 18: Indigenous Employment by NOC Skill Levels				
NOC	Total	Indigenous	Indigenous as a %	Non-Indigenous as a%
A	225	25	11.1%	88.9%
B	1490	270	18.1%	8.9%
C	3470	965	27.8%	72.2&
D	160	75	46.9%	53.1%
Coates and Finnegan, 2022 after Conference Board of Canada, 2021				

Similar challenges are noted in the Indigenous mining workforce by Jensen and Sandström (2020). The authors let

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[42] See Statistics Canada, 2018, https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/abpopprof/index.cfm?Lang=E

their interviewees speak to the issue of how the Indigenous labour force sees working in the mines in Northern Saskatchewan:

> *The challenge for the mining companies now, from what I have heard from them, is that all the entry positions are filled by northerners, but the jobs that need higher skills are beyond diploma, that require a degree or a masters. The challenge is to get northerners into management and higher.*
>
> *(Woman, Indigenous, former miner, now administrator)*

> *That ceiling becomes very apparent. You can see it. There is almost an ingrained or ineradicable something that doesn't hire into higher levels. […] You have to ask the question, why? They have competent people who can be in managerial positions, and they don't get them. So, I think the mining firm is starting to ask itself those questions, 'Why is this happening? We've got to be aware of it.'*
>
> *(Indigenous, manager at contractor owned by a band)*

This means that much of the Saskatchewan's Far North's natural resources industries are dependent on Fly-in/Fly-out (FIFO) workers recruited from outside of the region. There is an extensive literature on the negative impacts of FIFO workers on local Indigenous communities, which was reviewed by Finnegan and Jacobs (2015). They found that as the number of FIFO workers increased annually between 2004 to 2009 in Saskatchewan's Far North and Nunavut, so too did Inuit unemployment numbers, and the number of people not in the labour force.

Another issue is that "local workers are often not interested in harvesting jobs, which require risky physical work in remote locations, or in starting businesses that require a large investment in equipment"[41] (Conference Board of Canada, 2020). The Conference Board of Canada recognizes that:

> *Complicating the need for skilled workers is a more profound question about the acceptability of forestry as an industry. In these boreal forest regions where logging occurs, communities face a strong tension between opportunities for well-paid local work in the forest sector and concern for encroachment on traditional land-based lifestyles, as well as risks to ecological integrity. Those already involved in the industry share some of these concerns.*

By the same token, Jensen and Sandström (2020) note that:

> *Some would argue that FIFO enables national and provincial governments and the mining companies to continue colonization (Coulthard, 2007; Dorow and O'Shaughnessy, 2013; Hilson and Laing, 2017). In this view, Indigenous people in the north are co-opted through developing their employability, flying them to*

the mines, awarding them with business contracts as suppliers, making them dependent on capitalist mining operations that are based on turning their land into landscapes of profitability. Others see it as an empowerment of communities since long facing many social challenges, for Indigenous people to 'evolve' from traditional life to modern capitalistic life and to 'get out of welfare.'

The boom-and-bust cycles of the natural resource sectors are also a challenging base to build the regional economy upon.

In the past, governments have invested in forestry training programs but many of those programs ended decades ago with aging employees. Instead, training and development has increasingly fallen to the industry. As the Conference Board notes: "Currently, Saskatchewan lacks a body to coordinate skills development partners across the province, like the B.C. First Nations Forestry Council. That Council works with partners to build a broad base of Indigenous capacity to work in forestry occupations." A Saskatchewan First Nation organization had started to look at developing a similar training council in 2019, but the pandemic has delayed plans.

3.8 Preconditions for Labour Force Participation, early years education, child literacy and school absenteeism

The preamble to the OECD 2017 report, *Promising Practices for Supporting Success for Indigenous Students,* begins with the following:

Colonization processes have had a profoundly negative impact on successive generations of Indigenous peoples in Canada. UNICEF recently looked at four measures of child well-being: income inequality, educational inequality, health inequality and life satisfaction. Of 35 countries, Canada ranks in 26th place, meaning that young Canadians grow up in contexts characterized by relatively wide inequalities, especially, income, health, and life satisfaction, although less so for education. Canadian data show that poverty rates among the children of Indigenous families are higher than among non-Indigenous families.

The detrimental effects of early settler-colonial policies are still active in many families and communities (Karl et al., 2020). An important way of reducing inequities during early childhood is through the provision of high-quality early childhood education and care (ECEC, Heckman, 2017). Thus, investing in high-quality ECEC programs for Indigenous children is critical to redressing socio-economic imbalances. Yet, evidence shows that Indigenous children have lower levels of access than their non-Indigenous counterparts to such programs (OECD, 2017-1).

There is also the issue of the lack of training of the teachers and principals who deliver education to First Nations people, and on the nature of the curriculum which usually lacks Indigenous input or practicality. As McCue (2018) notes: "First Nation people are pragmatists. If something from outside their culture and traditions has value and relevance, it quickly becomes an integral part of their culture. They accept and integrate into their cultures what works for them. The best and most recent examples are the snowmobile, ATVs, chainsaws, and satellite telephones."

In interviews with First Nation leaders in education and industry, one interviewee stated another troublesome characteristic of teacher transiency. This was an aside to a much more important discussion regarding throwing away the K-12 curriculum approach to Indigenous education and moving towards an Indigenous pedagogy. This is being done in some Yukon communities that have increased First Nations' content; in response, some Newcomer Society families questioned the relevance to their children's educational requirements. The solution has been to form a Yukon First Nation School Board (December 2021).[43] As the graphic states, "it's our right to assert our authority of education".[44] One interviewee noted:

> *Coming up [to the Yukon First Nation School Board] gives me hope, because they have an Indigenous pedagogical... It's built for competencies, experiential learning... all those parts. But no matter what your creation is, [it will be a total disconnect] if you don't teach your teachers to deep dive (into Indigenous culture).*

Ultimately, new federal education policies and budgets will fail to improve education outcomes if authorities continue to ignore the curriculum in First Nations schools and overlook how teachers and principals who work with First Nations students are trained (McCue, 2018). McCue is particularly critical of the First Nation's teacher college programs, writing:

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[43] See: Government of Yukon, https://yukon.ca/en/learn-about-yukon-first-nation-school-board
[44] See: Government of Yukon (2021): https://static1.squarespace.com/static/5ddc27b50cfd2a79a6da6595/t/618c015cffb400500fb28a01/1636565340756/Reconciliation.pdf

 See: Government of Yukon (2021): https://static1.squarespace.com/static/5ddc27b50cfd2a79a6da6595/t/618c015cffb400500fb28a01/1636565340756/Reconciliation.pdf

Since the mid-70s, approximately 5,000 trained First Nations and Métis teachers, at a minimum, have been working at one time or another in a First Nations school somewhere among the 630 reserves across Canada. The continued persistence of unacceptably low high-school graduation rates for First Nations students nationally should raise some serious concerns about what these specialized First Nations teacher education programs have contributed to the quality of First Nations elementary and secondary education since their inception.

Demonstrably, there is need for greater Indigenous community input into the education system. Indigenous people should have a voice at the education table defining what the curriculum should look like and how it is taught; an occasional Indigenous representative teacher in the school is not sufficient. This is not a new concept. In 1989, Mary Simon stated at the Inuit Circumpolar Conference:

The success of Native education is directly related to the amount of community control and involvement there is in the school system. Only when Native people feel a part of that system, that they have a stake in it, will they assume responsibility in a meaningful way and become committed to its success. [45]

Cai and Gut (2020), in their article *Literacy and Digital Problem-solving Skills in the 21st Century*, use PIAAC data to shows that U.S. educators are at a great disadvantage vis-a-vis their peers in Finland and Japan in terms of literacy, ranking the lowest in digital problem-solving skills among the four studied countries. Other key findings include (a) in Canada and Finland, educators perform significantly higher in literacy than non-educators in their respective countries; (b) young educators in the United States (under age 35) lag far behind the same age group in Finland, Japan, and Canada; and (c) in all four countries, digital problem-solving skills of educators tend to decrease as their age increases. While Cai and Gut (2020) do not draw upon Indigenous data bases in their study, a similar analysis that stresses Indigenous and non-Indigenous teachers in Canada could help define challenges the teaching profession may be having in delivering a balanced curriculum that stresses literacy, numeracy and problem-solving.

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[45] Quoted in: Larsen, Nymand and Gail Fondahl (editors). 2015. '*Arctic Human Development Report: Regional Processes and Global Linkages*. Joan Copenhagen: Nordic Council of Ministers.

McCue (2018) also believes that including subjects in First Nation schools that have an applied value will persuade parents and community leaders that formal education has benefits beyond basic literacy and numeracy. If the school curriculum can provide their youth with valuable applied skills as well as a solid level of literacy and numeracy, parental interest in their children's education will be enhanced. What educators and legislators need to bear in mind is that improving education outcomes for First Nations youth depends on convincing parents in ways that are meaningful to them and their communities. Measurable proof of the value of education in the form of young adults possessing practical and applied skills, in addition to literacy and numeracy, is desperately required. The wholesale application of the provincial education systems on First Nation schools during the past six decades has failed to persuade 75% of parents and students that a formal education beyond grade 10 or 11 is worth pursuing. In *Promising Practice in Supporting Success for Indigenous Students* (OECD 2017-1) the authors recognize the role of the family as elemental to the educational success of children:

> ***Engaging families:*** *Where respect, trust, and positive relationships have not always been part of historic or recent experiences, families are likely to be wary of engaging with school staff. However, where bridges are built and mutually respectful relationships are formed, the benefits for students can be huge.*

McCue also notes that principals also need to learn how to deal positively with the resistance by both families and students to battle the high absenteeism rates of First Nations students in both on and off-reserve schools.

Next, Preston et al. (2012)) highlights the challenges that First Nation educators face in recruiting early childhood education and care specialists. Factors contributing to the shortage of qualified Aboriginal early education teachers include stringent early education licensing requirements, prohibitive costs of initiating and maintaining programs, large geographical distances between post-secondary institutes and Aboriginal communities, and specialized entry requirements necessary for students pursuing post-secondary education. Early childhood education teachers are generally required to attain standardized qualifications before being considered for employment within the early childhood education sector. Furthermore, most Aboriginal early childhood programs require a formal license from provincial authorities before being funded.

A one size fits all curriculum set by provincial authority has not worked, while in communities such as the Yukon that have attempted to increase First Nation content, some Newcomer Society families question the relevance to their children's educational requirements if they include First Nations teaching. The solution in Yukon has been to form a Yukon First Nation School Board (December 2021).[46]

McCue recognizes the positive work of the Martin Aboriginal Education Initiative introduced pilot program for principals in First Nations education in providing a much-needed model for principals and would-be principals wishing to improve their skills and knowledge in First Nations education (McCue 2018). But again, is this not a newcomer-led program projecting a solution onto a perceived and defined problem as defined by the dominant society?

In contrast to McCue's persuasive opinion, the OECD study by Karl et al (2020), *A Strong Start for Every Indigenous Child OECD Education Working Paper No. 251*, builds on the deep databases available through the OECD to construct a comparative analysis of the education of Indigenous youth in Aotearoa New Zealand, Australia, and Canada, all countries that incurred similar British colonialism based on Newcomer Society conflict. They recognize that detrimental effects of early settler-colonial policies are still current today in many families and communities. Working from Heckman's perspective they argue that Egert et al. (2022) found that students previously enrolled in pre-school for more than one year perform better in student skill tests, improving their test scores by

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[46] See: Government of Yukon, https://yukon.ca/en/learn-about-yukon-first-nation-school-board

between 8.2 and 9.6 points. Flanagan et al. (2015) describes a summer learning program in New Brunswick run with a First Nations community's participation that stressed outdoor recreation and literacy as a method of overcoming the loss of literacy that many Indigenous, and other students incur during their summer vacation. They stress that properly acquiring literacy skills in the early years is critical: Children who continue to struggle with reading by the end of Grade 3 are more likely to have long-term detrimental effects (i.e., more likely to drop out of high school, poor health, lower income). Positive early child development (before age 5) has been linked with better educational attainment, physical and mental health, socio-economic outcomes, self-reported life satisfaction and well-being as individuals age (Karl et al., 2020; Health Canada and Public Health Agency of Canada, 2017). What is worrying is the window for positive early learning closes when children are about 7 years old, due to a sharp decrease in brain malleability. This emphasizes the importance of high-quality education and intervention programs early on, particularly for children at-risk of reading difficulties.

The 2021 OECD report recognizes the advances being made in Yukon where First Nation languages are being protected through the Yukon Languages Policy, with instruction being integrated into the schools at an early age. While Canada has developed several child head start programs such as Aboriginal Head Start in Urban and Northern Communities, many barriers continue to deny qualified early educational opportunities to Indigenous children. In 2019, Pasolli concluded that early learning and childcare in Canada "is in a perpetual state of crisis. Numerous studies and assessments paint a nationwide picture of a severe shortage of spaces, unaffordable fees, poor working conditions for early childhood educators, service gaps that have led to the expansion of for-profit services, and programs of questionable quality [with the exception of Quebec]." It is hoped that the new federal Early Learning and Child Care Plan, announced April 2021, will help alleviate these inequalities in Indigenous communities, although this is a nation-wide program open to all Canadian families.[47]

Ultimately, solutions need to come from within communities, through their right to consultation, while respecting their sovereignty to build their own educational programs. Karl et al. summarize recommendations around eight (8) community oriented/community driven solutions. These are:

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[47] See, Budget 2021: A Canada-wide Early Learning and Child Care Plan, https://www.canada.ca/en/department-finance/news/2021/04/budget-2021-a-canada-wide-early-learning-and-child-care-plan.html. This builds on specific policy framework for Indigenous ELCC, released in 2018. See
https://www.canada.ca/en/employment-social-development/programs/indigenous-early-learning.html.

1. Partnership between Indigenous communities and education agencies as a fundamental platform for strategies and polices affecting Indigenous children and their families.
2. A holistic approach to achieve child and family well-being, addressing the range of needs that affect children's development.
3. Early support for children and families, where additional assistance is beneficial.
4. Early years policies that are culturally responsive, meaning these are led and developed with the Indigenous communities the policies are intended to support.
5. Confident, capable Indigenous and non-Indigenous early years educators, with skills and knowledge in local Indigenous cultures and languages, and in early years pedagogy.
6. Bridging children's home languages, to strengthen children's overall development and language learning.
7. Broad, strengths-based assessments to track child development and well-being, and to reflect local priorities such as language and cultural knowledge.
8. Child-ready schools, to manage smooth transitions for children's entry to school.

Study upon study defines the young Indigenous population as an untapped labour force. In 2016, the National Aboriginal Economic Development Board estimated that the Canadian economy was missing out annually on $27.7 billion in GDP because of its "under-utilized" Indigenous workforce. Two of the major factors they based their analysis on were:

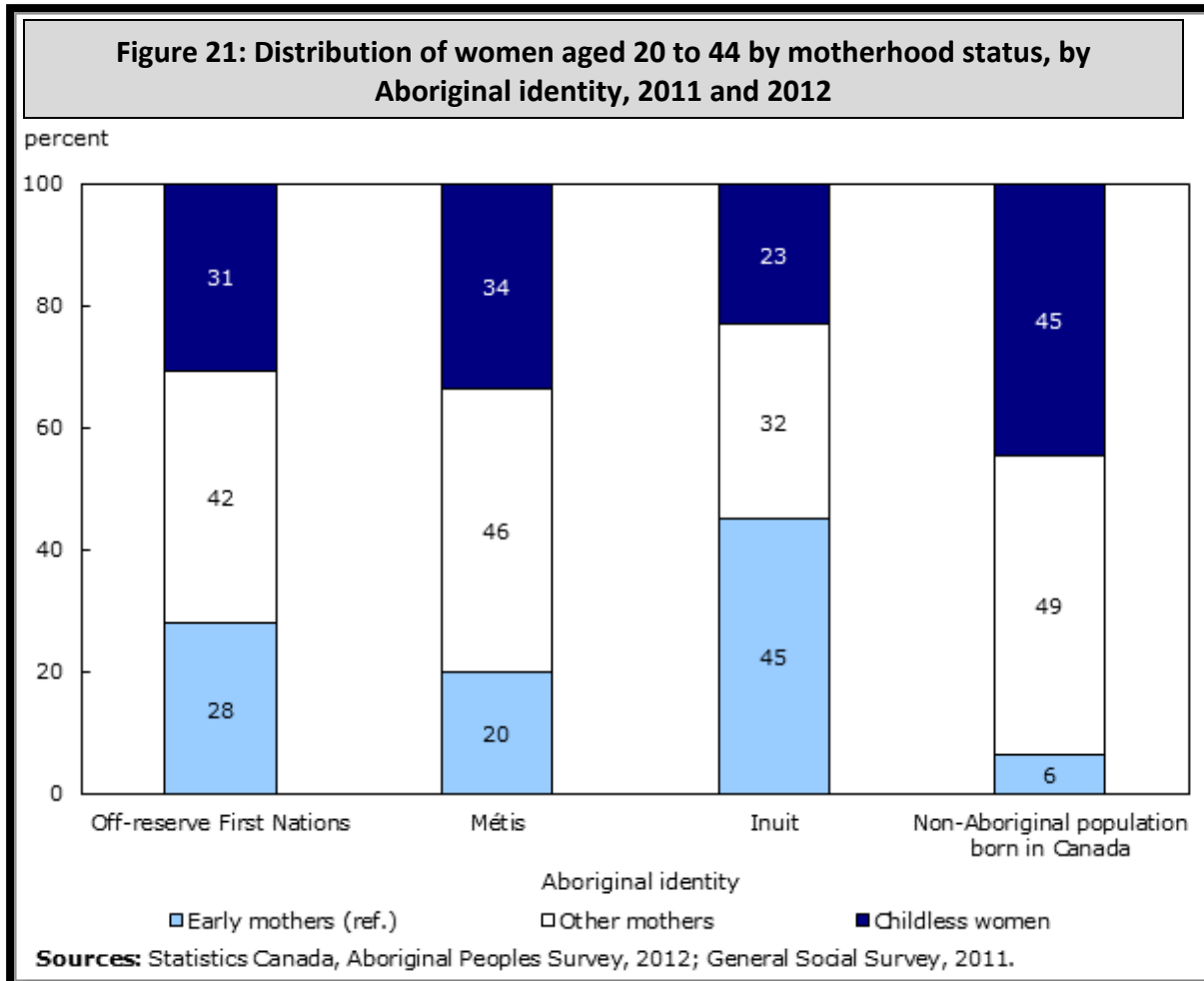- In 2011, the high school completion rate among Indigenous people was 18.5 percentage points below the non-Indigenous rate.
- The university completion rate was 15.6 percentage points lower among the Indigenous population, relative to non-Indigenous Canadians in 2011.

How much higher might their evaluation of lost GDP have been if it included the high absenteeism that occurs from primary school through secondary programs?

Figure 20: System-level priorities supporting progress for Indigenous students, likely impact on student outcomes and costs (OECD, 2017)
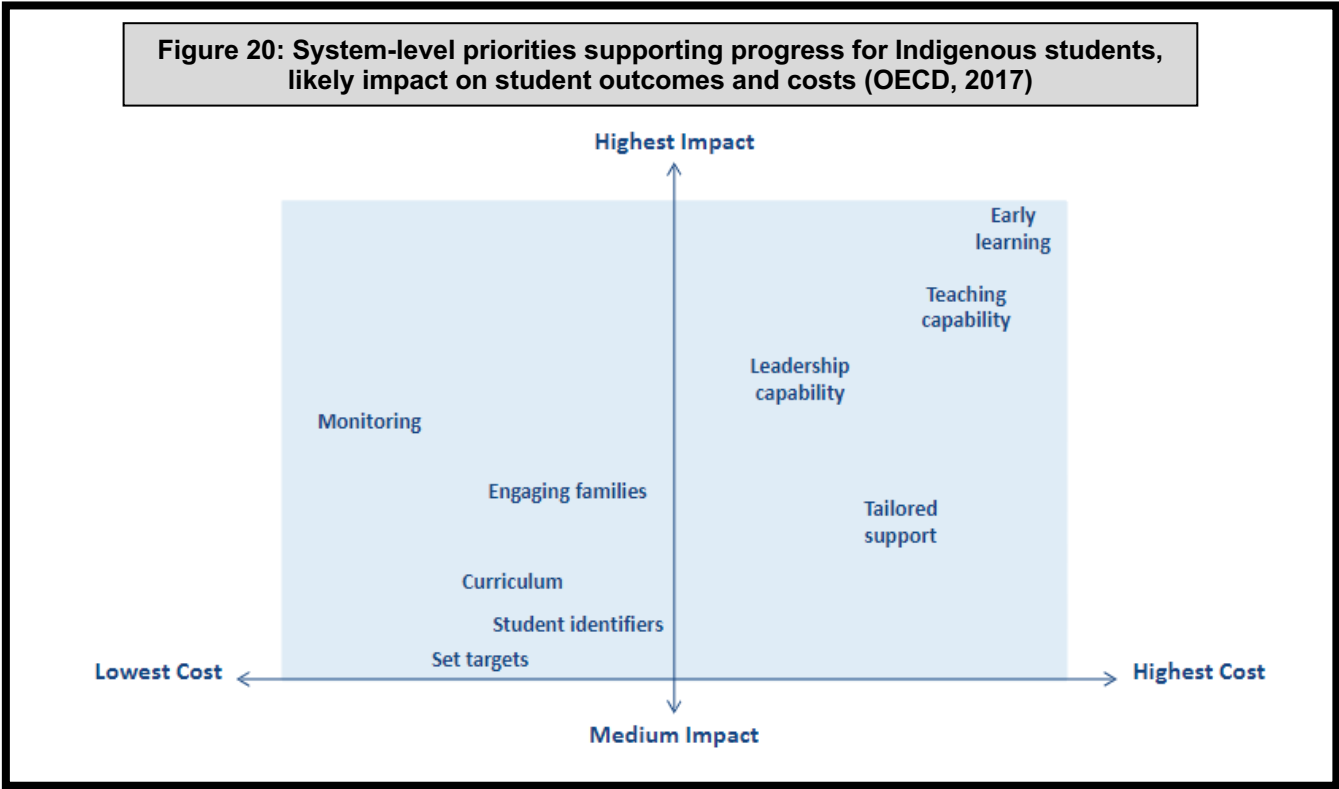
The OECD (2017) reports that "early learning is the single most powerful lever for achieving a step change within a generation." While early learning programs are the most impactful, they are also the most expensive to implement. This long-cycle perspective on developing human capital will be essential to build a dynamic, adaptable, and inclusive

Figure 21: Distribution of women aged 20 to 44 by motherhood status, by Aboriginal identity, 2011 and 2012

percent

Aboriginal identity

☐ Early mothers (ref.)　　☐ Other mothers　　■ Childless women

Sources: Statistics Canada, Aboriginal Peoples Survey, 2012; General Social Survey, 2011.

Canadian labour force. There are many socio-familial situations that impact early learning. Historically, Indigenous females have children at a much younger age, often prior to completing their secondary school. Statistics Canada's 2016 Census reports that Indigenous girls aged 15-19 years are more likely to become parents than non-Indigenous teenage girls. The 2006 Census indicates that while only 1.3% of non-Indigenous teenage girls were parents, 8% of Indigenous teenage girls were parents (9% of all First Nations and Inuit girls, 12% of First Nations girls living on-reserve, improving to 4% of Métis teenage girls). Boulet and Badets (2017), using data from the 2012 Aboriginal Peoples Survey, shows that 45% of Inuit women are early mothers; this figure was 28% for First Nation off-reserve, and 20% for Métis women. Not surprisingly, early motherhood was linked to incomplete education. Among both Aboriginal and non-Aboriginal women, the proportion of women with at least a high school diploma was significantly lower among

women who had their first child during adolescence (figure 21)[48]. Among Métis women aged 20 to 44, 58% of those who had a child during adolescence had a high school diploma, compared with 84% of other mothers in the same age group, and 92% of childless women. This highlights the need for a wide range of culturally appropriate supports for pregnant and parenting Indigenous women, and culturally appropriate information about sexuality and contraceptive use for Indigenous teens. Supports should include educational completion and advancement as well as early childhood learning support for mother and child.[49]

3.9 Current approach under-estimates the importance of lifestyle and life-cycle realities

Trauma, childhood, and intergenerational intra-community all impact the childhood and adult learner. How does one account for these social conditions within Indigenous communities as new research and new interpretations/reinterpretations of this history are brought forward? Fitzgerald et al. (2021) examine the literature on the various responses to trauma suffered by Indigenous peoples because of governmental policies geared toward assimilation. Much of the research has been done in the United States to develop theories around historical trauma and race-based traumatic stress; however, First Nation responses in Canada due to the similar histories of oppression and colonization. A common theme across the spectrum is that self-government and a connection to culture and spirituality result in better outcomes for Indigenous people, as they battle the ongoing intergenerational trauma of colonization.

"Trauma" and "Complex post-traumatic" are defined by Haskell and Randall (2009) as a "range of possible, typical, and normal responses people have to an extreme and overwhelming event, or series of events [and the] the ways in which traumatic stress is experienced by individuals, while also attending to the relevance of the social contexts which shape this very experience". While "complex post-traumatic stress "is a form of a traumatic stress response flowing from more chronic and protracted traumatic experiences … [and] is multidimensional and pervasive because it is often the result of ongoing damaging and neglectful experience" (Lindstrom, 2018).

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[48] See: Statistics Canada, https://www150.statcan.gc.ca/n1/pub/75-006-x/2017001/article/54877-eng.htm - n17
[49] See, O'Donnell, V., & Wallace, S. (2011). *First Nations, Métis and Inuit women. Ottawa, ON: Statistics Canada – Catalogue no. 89-503-X. and Archibald, L. (2004). Teenage pregnancy in Inuit communities: Issues and perspectives. Ottawa, ON: Pauktuutit Inuit Women's Association.*

Other authors state that "historical trauma" has been defined as "a cumulation of emotional and psychological wounding over the life span and across generations emanating from massive group trauma" and in the Native American context includes: the removal of children from families, and the placement of children in boarding schools or temporary shelters that were not originally designed to accommodate these individuals, forcing individuals, communities, and nations to move from their homelands to live on reservations, various modes of racially and religiously motivated genocide and many other historical events that lead to such outcomes as intergenerational trauma.

Kim (2019) links the intergenerational traumata imposed upon Indigenous peoples through decades of systemic discrimination in the form of the Residential School System and the Indian Act, and their loss of socioeconomic status to their poorer health outcomes. He argues that health care providers should be aware of the trauma of colonialism in their health care program delivery. Indeed, a broad range of educational and skills training literature mirrors the health care literature regarding the impact of traumatic colonialism on the well-being of Indigenous people. Miller et al. (2022) continue this theme in a study of Indigenous youth and resiliency in Canada and the USA, finding that Indigenous youth have been under-represented when studying pathways to mental wellness. Yet, a broad range of adversity is acknowledged, from intergenerational and ongoing trauma arising from colonial policies. In a large literature review they found that few Indigenous-specific measures of resilience exist, with studies relying on Western measures of psychological resilience, although related concepts such as: *walking a good path," "good mind," Grandfathers' teachings on seven values, decision-making for seven generations into the future,* spoke to the "western" concept of resilience. In summary of their literature review Heid et al (2022) found that:

> *Youth stressors included the following: substance use, family instability, and loss of cultural identity. Youth resilience strategies included the following: having a future orientation, cultural pride, learning from the natural world, and interacting with community members (e.g., relationship with Elders, being in community and on the land). Indigenous traditional knowledge and cultural continuity serve as prominent pathways to Indigenous youth resilience.*

In addition, a number of leading researchers on historical and race-based trauma note emotional neglect/abuse, severe mental distress Low SES Large family size (overcrowding) paternal criminality, maternal psychiatric disorder, admission to care of local authority, physical abuse, sexual abuse, physical neglect domestic violence, household substance abuse, mental illness in households, parental separation or divorce and amongst other problems, criminal household member(s) (Fitzgerald et al., 2021). A profound sense of these issues can be found in the preamble to Gabrielle Lindstrom's 2018 doctoral thesis at the University of Calgary, in which she openly discusses the

impact of trauma on her as a Blackfoot woman within the Canadian higher education system:

> *As a Blackfoot woman entering the academy, I bring my own life experiences to bear within this work. I encountered many hardships when I entered into post-secondary education studies, both within the academic institution and outside of it. These hardships were directly connected to my own responses to cyclic violence as I also struggled to maintain a false sense of identity that was predicated on colonial constructions of Indigenous culture (Cote-Meek, 2014); rooted in the local non-Indigenous community's negative conceptualizations of my Blackfoot people. Compounding these difficulties, I often participated in a weekend ritual of intentional amnesia that was self-induced by way of alcohol abuse. During these times of "forgetting," a term I have adopted when referring to these moments, I witnessed much violence and suffered from the after-effects of persistent trauma made more acute by having to endure the stares of classmates and professors upon returning to the classroom.*

Fitzgerald et al (2021) notes that moving beyond resilience towards active resistance can return the sense of agency to racial-ethnic groups and communities (Johnson et al., 2021). In Canada, the Idle No More movement sits squarely in the framework of resistance to neo-colonial policies such as the Harper government's Bill C-45 which would have reduced Indigenous rights. Coates argues that the Idle No More movement in 2012-13 was the most profound declaration of Indigenous identity and confidence in Canadian history, sparked by Aboriginal women and their supporters, sustained by young Indigenous peoples, filled with pride and determination.[50]

3.10   The COVID-19 Pandemic and the Potential Widening of the Educational Gap

COVID-19 continues to illuminate how the experiences of Indigenous Peoples are rooted in racism, oppression, land dispossession, and displacement (Rose, West, and Carroll, 2022).[51] In the 2021 Indigenous World update on Indigenous Data Sovereignty, COVID-

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[50] Coates, Ken. #IdleNoMore: And the Remaking of Canada. Regina, Saskatchewan: U of Regina, 2015. Print.
[51] See: https://iwgia.org/en/ip-i-iw/4699-iw-2022-Indigenous-data-sovereignty.html -_edn29

19 was described as having an exacerbating impact on existing inequities and inequalities experienced by Indigenous communities. Limited access to quality healthcare, higher infection and fatality rates, as well as the differential impacts of economic and social upheaval continue to be key issues for racialized people, including Indigenous Peoples during the pandemic.

The COVID-19 pandemic caused educational disruptions that may have long-long effects, especially in Indigenous communities where many Indigenous youth could not access online education or participate fully due to digital or technological divides. This is the opinion of Dinku et al. (2020), writing from an Australian perspective, who states that the "ongoing digital divide may be a particular problem for Indigenous people accessing work remotely. Poor access to the internet of a substantial number of Indigenous households may also exacerbate access to remote education. Such issues have important implications for addressing Indigenous disadvantage in future."
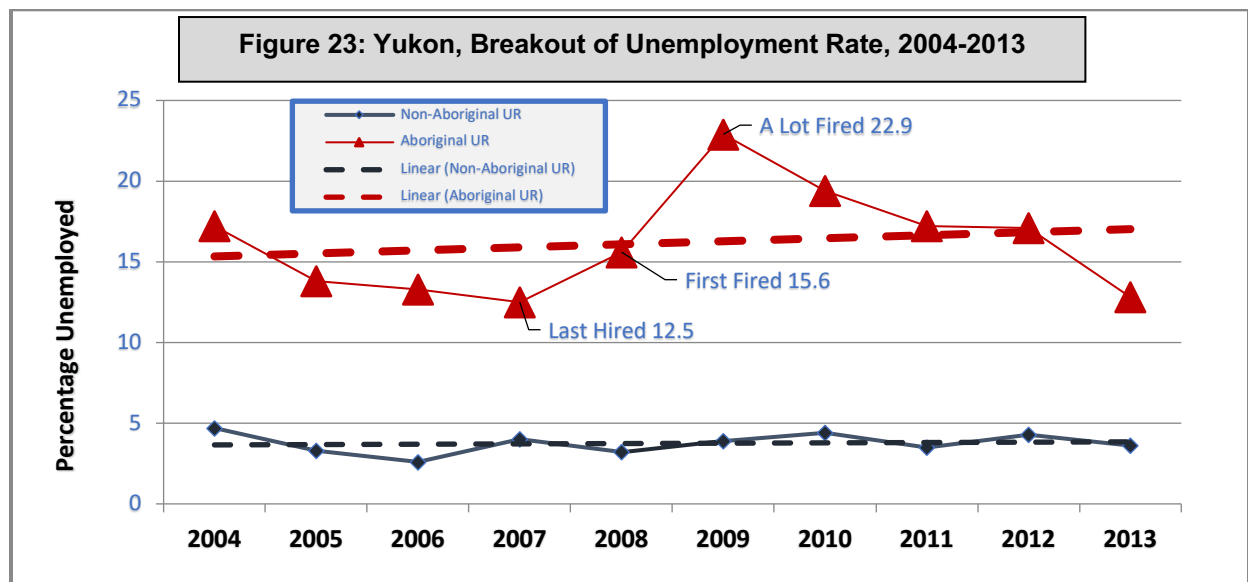
Aylsworth and Filice (2022) note the COVID-19 pandemic slowed or halted employment in various industries around the world. In Canada, the pandemic caused the employment rates of both Indigenous and non-Indigenous people to decline. However, Indigenous employment rates are recovering at a slower pace than their non-Indigenous counterparts. Between 2019 and 2021, the unemployment rate for the total population rose from 5.8% to 9.6%, and then fell back to 7.5%. However, First Nation unemployment rates continued to be almost two times higher than the national average, at 14.4% in 2021. The relatively large Indigenous employment declines reflect the fact that many Indigenous people work in occupations hit hardest by the pandemic, such as transport, trade, retail, and services. "*Last hired, first fired*" was recently coined by the

Figure 22: Canada Labour force characteristics, Indigenous group 1 2017-2021 as a Percentage					
Unemployment Rates Both Sexes, 15 years and over					
	2017	**2018**	**2019**	**2020**	**2021**
Total population	6.4	5.9	5.8	9.6	7.5
Indigenous population	11.4	10.4	10.2	14.2	11.6
First Nations	13.5	11.7	11.9	15.1	14.4
Métis	9.4	9	8.4	13.3	8.8
Non-Indigenous population	6.2	5.8	5.6	9.4	7.4
Statistics Canada. Table 14-10-0365-01 Labour force characteristics by region and detailed Indigenous group https://www150.Statistics Canada.gc.ca/t1/tbl1/en/tv.action?pid=1410036501 Coates and Finnegan, 2022					

US Federal Reserve Bank on the impacts of COVID-19 on Black workers in America;[52] First Nation employees in Canada suffer a similar prejudice.

The impact of the 2008-09 recession is captured by Finnegan (2013) in a review of the Aboriginal labour market in Yukon where the Indigenous population represents a substantial 24% of the population. The recession appears to have barely passed as a ripple through the non-Aboriginal population but to have gravely impacted the Aboriginal labour force with the unemployment rate jumping from 12.5% in 2007 to 22.5% in 2009 (Figure 23).

Figure 23: Yukon, Breakout of Unemployment Rate, 2004-2013

Figure 24: Unemployment rate, by Indigenous identity, three-month averages, population living off reserve in the provinces, Canada, December 2014 to August 2021, not adjusted for seasonality
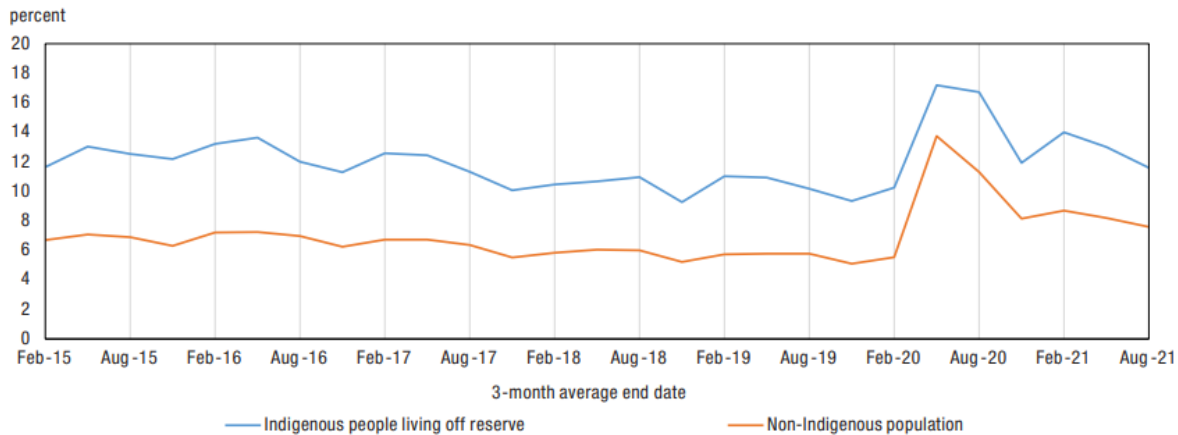
Source: Statistics Canada, the Labour Force Survey.

The challenges created by the pandemic in the Indigenous labour market are also reviewed by Bleakney, Masoud, and Robertson (2020) who recognize that layoffs as a result of business closures, as well as inconsistencies in childcare and school availability have amplified pre-existing employment disparities and slowed labour market recovery, particularly for Indigenous women and youth. They use the Labour Force Survey which provides the timeliest data available on labour market characteristics of Indigenous people in Canada. The data in this report refer to Indigenous people living off-reserve in the provinces. Figure 24 illustrates the higher unemployment rate (UR) of Indigenous workers overall, as well as the slower recovery vis-à-vis the non-Indigenous population. Producing more comprehensive data on the unemployment scenario on-reserve post-pandemic is the next obvious step.

Employment levels among Indigenous women particularly suffered during the pandemic. The LFS shows that in 2019, the unemployment rate among First Nation women aged 15 + was 10%, climbed to 14.1% in 2020, and remained high in 2021 at 13.1%. In comparison, the unemployment rate of non-Indigenous women rose from 5.9% in 2019 to 9.4% in 2020, recovering to 7.9% by 2021. These trends reflect the pandemic's impact on home life, as many parents – particularly women – took on childcare in the home.

Bleakney, Masoud, and Robertson (2020) also note that different age-cohorts have been differently impacted by the COVID pandemic. For one, older "Indigenous workers, who are more vulnerable to the economic and health impacts of COVID-19 may have opted to retire earlier than planned, possibly to avoid associated health risks". On a more

positive note, they found that the labour force participation rate among Indigenous youth was 66.8%, the highest since the onset of the pandemic, and 3.0 percentage points above that which was seen in the summer job market one year earlier. The employment rate among Indigenous youth reached 57.4% in the three months preceding August 2021, surpassing the pre-pandemic employment level of 47.4% observed in summer 2020 (Figure 24). Further research is required as to why this may be happening.

A detailed Australian perspective of the impacts of COVID-19 on the future of the Aboriginal labour force is presented by Dinku (2020) who, in studying the policy responses to macroeconomic shocks and the policy responses, found limited positive feedback for the Indigenous labour force. Dinku notes that the sectoral concentration of Indigenous employment, the relatively high levels of casual employment, and the relatively young age profile of the Indigenous population increases Indigenous exposure to significant economic risks. He notes that Indigenous business disproportionately employs Indigenous workers, but such businesses are concentrated in small to medium enterprises that may be sensitive to recessionary conditions, especially if economic uncertainty leads to a more generalized financial crisis involving liquidity constraints. In addition, for employed Indigenous people, it can be difficult to retain employment. COVID-19 is likely to lead to an intense period of structural adjustment in the economy, and it is important for the Indigenous community and businesses to position themselves to take advantage of potential opportunities and minimize potential risks.

A topic rarely broached in the literature is resiliency (Finnegan and Coates, 2015). A growing body of work identifies factors that contribute to healthy development and well-being in situations of adversity for both the individual and for the community. Resilient Indigenous communities are linked to language and the land, an ecological continuity (Heid, 2022). Heid et al (2022) conclude in their study of Indigenous youth resiliency (and this is certainly the target population for future skills development) that:

> *Resilience is a complex, multi-faceted process that involves an interplay between stressors, resilience-promoting factors, and pathways. For Indigenous youth, resilience plays a significant role in their lives as they face unique, multi-leveled, and persistent stressors. While most studies note the role of trauma, no studies measured trauma symptoms or experiences directly, or comprehensively included such facets as intergenerational trauma, loss and grief, or ecological anxiety or grief. Some studies considered sex difference, but no studies included in this review considered gender categories, or specifically noted two-spirit youth. This suggests that the definition, meaning, and process of resilience may change depending on the mental health variables studied, as well as the inclusivity of youth groups.*

Figure 25: COVID Death Rates/100,000 of Indigenous Canadian living on-Reserve Compared to the Rest of Canada, as or Jan. 06, 2022								
Canada Total Deaths	Canada 2016 Census Population	Death Rate /100,000	Canada total Deaths - Not On-Reserve	Canada Pop - Not On-Reserve	Death Rate rest of Canada /100,000	Deaths On-Reserve	Canada 2016 On-Reserve Pop	Death Rate On-Reserve /100,000
30,788	35,151,728	*87.59*	30,219	34,820,703	*86.78*	569	331,025	*171.89*
Sources: Indigenous Services Canada https://www.sac-isc.gc.ca/eng/1598625105013/1598625167707 (Accessed Jan 10, 2022), Statistics Canada https://www150.Statistics Canada.gc.ca/n1/pub/41-20-0002/412000022021001-eng.htm Coates and Finnegan, 2022								

3.11 Corporate Education and Training and Human Capital: An alternative pathway to success

There are numerous corporate initiatives focused on connecting Indigenous individuals to skills training for specific work opportunities. However, few academic research studies have focused their attention on the evaluation on corporate initiatives, likely due to a lack of data, as well as required transparency (Pearson and Daff, 2013). Statistics Canada's new 2022 research program, the Education and Labour Market Longitudinal Platform and Associated Datasets (ELMLP), which may help address these issues. "The ELMLP allows longitudinal integration of administrative data related to education with other data sources to create anonymized, customized datasets for analytical purposes. The ELMLP fills data gaps and enables a greater understanding of student and apprenticeship pathways, transitions to the labour market and outcomes over time."[53] A review of the program does not indicate if Indigenous markers are used in the dataset as it is currently designed, but as per usual Statistics Canada could, in all likelihood, generate Indigenous panels.

The academic literature is surprisingly sparse on the role of corporations in the delivery of skills and training. This is surprising as human capital is at the core of industry, in natural resources which are often dependent upon Industrial or Comprehensive Benefit Agreements that include local hiring quotas. Pearson and Daff (2013) provide a case study from Australia whose title itself is indicative of the challenges arising from the

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[53] See: Statistics Canada (2022) Overview of the Education and Labour Market Longitudinal Platform and Associated Datasets, Ottawa: Catalogue no. 37200001 ISBN 978-0-660-43488-9 https://www150.statcan.gc.ca/n1/pub/37-20-0001/372000012022004-eng.pdf

introduction of western mining into Indigenous culture: "Transcending hunter gatherer pursuits while balancing customary cultural ideals with market forces of advanced western societies: Extending the traditional boundaries of Indigenous Yolngu people of the Northern Territory of Australia." Their study reports on four years' worth on data related to the job outcomes of Indigenous Yolngu people of East Arnhem Land in the Northern Territory of Australia. The Yolngu people were participants in a unique vocational-educational program set up by the multinational mining company Rio Tinto Alcan. They note that a set of timber-related Indigenous social entrepreneurial endeavors were undertaken by one of the Aboriginal communities in the region who had originally withdrawn from the initial vocational-educational mining training program which illustrates they believe the relevance of strong cultural continuities for community members to work in the forestry industry versus mining (Pearson and Daff, 2013).

Pearson and Daff's found incredibly high program attrition rates being incredibly high. Out of an initial 337 interested applicants, 199 did not follow through on their statement of interest because they were "required to present documentation of formal education, work references or Aboriginal certification." In the end, only 138 started the program. They also believe that low literacy and poor health also reduced applications. Subsequently, they report that 94 of the 138 departed the program. Of the remaining 42, only 21 graduated to full-time employment, including 8 in apprenticeships. The other 21 applicants are still going through the Work-ready and work-starts process, leading up to being trained to start apprenticeships in the mining sector. These figures represent a completion rate of 15% for those that qualified to start the program versus 6% if we use the "n" of those Indigenous community members that originally asked about the program[54]. The authors do note that some of the candidates who moved through various stages of the program left to take jobs or create businesses, also a positive outcome (Pearson and Daff, 2014). They conclude that the low level of success in this particular program is due to:

- Welfare programs which have eroded work skills and interest in skills and training
- Substance Abuse which screened out applicants
- Limitations in literacy and numeracy skills
- Involuntary removal from program (incarceration)
- Alternative opportunities arising

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[54] In Canada, the Apprenticeship and Trades educational attainment in 2016 for First Nation people stood at around 10%. Statistics Canada Catalogue no. 98-510-X2016001. Ottawa. Released July 18, 2018. http://www12.statcan.gc.ca/census-recensement/2016/dp-pd/abpopprof/index.cfm?Lang=E

In the Australian context, training for employees to impart 'cultural awareness' concerning Indigenous people has become a common feature within the mining industry. The training aims to foster good relationships between companies and Aboriginal Traditional Owners of land, and to increase Aboriginal employment within the industry The review examines how this training is being implemented at several major Rio Tinto Iron Ore (RTIO) mines in the Pilbara region of Western Australia.[55] The study finds that the corporate sector's commitment to educating workers about cultural difference is difficult to achieve in this highly politicized setting. The paper argues for an understanding of the complexities and strategic politics involved in implementing Aboriginal cultural awareness training to avoid both naïve expectations and unintended negative consequences.

In the early 2010s, an independent mining company entered into a comprehensive benefit agreement with an undisclosed First Nation on the development of a mine in their territory. The local First Nation has a long history of participation in mining, but until 2019, had never ventured into the ownership of mineral exploration companies or staking mining claims. This created numerous opportunities for the First Nation community, from business partnership benefits to hiring opportunities. The mine provided monthly declarations on which companies held contracts on-site, as well as who they were employing in terms of local First Nations, non-local First Nations, and non-Indigenous workers. Gender breakdowns were also provided, as shown in Figure 26. As one mine employee stated, "We are operating on First Nation land, so they need to benefit jobwise. We have agreements with the community to hire and facilitate training, mentoring, career advancement, and so on."

In this region, approximately one-quarter of the population is Indigenous, so the 22% of all employees listed as working on site as "First Nation" by the mining firm shows proportionate representation. However, many of these employees came from elsewhere in Canada, for example, British Columbia, Alberta, and Manitoba. At the mining firm, female representation on-site stood at 14.1%, which is slightly below the national average for women in mining reported by the Ottawa-based Mining Industry Human Resources Council report, *Exploring Gender Inclusion* (2016) of 17%.

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[55] Parmenter, Joni, and Rodger Barnes. "Factors supporting indigenous employee retention in the Australian mining industry: A case study of the Pilbara region." *The Extractive Industries and Society* 8, no. 1 (2021): 423-433.

Company * if FN Owned	NAICS	Local First Nation	Other First Nation	Non-First Nation	Total Employees	% First Nation	Female	Male
First Nation Camps*	Camp & Food	1	31	26	58	55%	26	32
First Nation Electric*	Construction	0	0	8	8	0%	0	8
First Nation Earth Moving	Construction	1	6	22	29	24%	9	20
First Nation Enviro Engineering *	Engineering	0	0	5	5	0%	1	4
Local Heavy Equipment*	Construction	2	12	22	36	39%	3	33
Local Construction	Construction	0	0	4	4	0%	0	4
Stone Crushing	Mining & Aggregate	3	1	9	13	31%	0	13
Local Geomatics	Engineering (Survey)	0	1	4	5	20%	0	5
Local Heavy Equipment	Construction	9	33	88	130	32%	18	112
Heavy Duty Construction firm	Construction	0	1	9	10	10%	0	10
Outside Steel erectors	Construction	0	3	39	42	7%	2	40
Outside Construction	Construction	0	0	5	5	0%	0	5
Engineers Site Operations	Construction	4	8	34	46	26%	5	41
Engineers Design	Engineering	0	1	26	27	4%	5	22
International Builders	Construction	0	0	74	74	0%	2	72
A Northern Builder	Construction	0	1	12	13	8%	0	13
Steel Constructors	Construction	0	7	59	66	11%	7	59
Electrical Engineers	Construction	0	8	40	48	17%	3	45
Medical	Health & Medical	0	0	3	3	0%	3	0
Big International Firm	Engineering	0	0	1	1	0%	0	1
The Mining Company	Mining	3	1	6	10	40%	5	5
Totals		**23**	**114**	**496**	**633**	**22%**	**89**	**544**

Figure 26: Employment at an Anonymous Mine in Indigenous Northern Canada, December, 2018

Local hires, defined as citizens/members of the local First Nation originating from anywhere in Canada stood at 23 individuals. First Nation employment for males was heavily skewed to construction and heavy equipment operations, while female employment was skewed towards camp catering and accommodations employment.

Next, Saxinger and Gartler (2017) explore the impacts of Fly-in/Fly-out and rotational shift work in mining with Nacho Nyäk Dun First Nation. Saxinger and Gartler lived for multiple years in the Mayo, Yukon community, creating a rich, nuanced, and intimate catalogue of life in a remote community directly impacted by mining. They presented their findings

through a community accessible publication that stressed quotes, short commentary, and images of community and mining life. As Saxinger and Gartler note: "Training courses range from basic skills like literacy for those who dropped out of school, to financial management or alcohol and drug counselling. Training [is also provided] for trades like mechanics, drilling, machine operators, truck drivers, as well as in health and safety of first aid...with some courses coming right to the community."

Last, new insight into the corporate role of Indigenous skills and training is provided with the new research tools being developed by Statistics Canada's *Education and Labour Market Longitudinal Platform (ELMLP)* initiative that started in the 2010s*.* The ELMLP is being developed in collaboration with the provincial and territorial ministries of education, Employment and Social Development Canada (ESDC), and other stakeholders. The program allows for the longitudinal integration of administrative data related to education with other data sources to create anonymized, customized datasets for analytical purposes. The ELMLP enables a greater understanding of student and apprenticeship pathways, transitions to the labour market and outcomes over time. Data from the ELMLP can help address a wide range of policy questions pertaining to student and apprenticeship persistence, completion, mobility and pathways, as well as labour market outcomes. This data may allow policy makers to understand the different types of trajectories that students can take through their postsecondary education or apprenticeship training as well as student characteristics that may be related to these trajectories. It is hoped that ELMLP can help inform future research, program development, and policy planning related to Indigenous and other segmented populations' skill sets, apprenticeship uptake and education.

3.12 The less studied problem: Rural, Remote and On-Reserve Indigenous Literacy Challenges

The on-reserve population has a very different socio-economic profile than those living off-reserve. Alasia et al. (2017) found that approximately 46% of Indigenous peoples lived in predominantly rural remote regions in Canada and they are worse off than Indigenous peoples living in urban regions in terms of socioeconomic outcomes. These differences in socio-economic outcomes also vary by geography. It has been recognized that proximity to economic activities plays a key role in shaping a region's socio-economic opportunities. Remote communities facing much higher transportation costs impact a wide range of factors from the accessibility of services to the cost of doing business, and the delivery of basic community infrastructure.

The Arctic geographer, Robert Bone (1992) notes that most on-reserve communities are located in what he calls "non-economic places." Indian Reserves, even those in

agriculturally rich areas such as the Prairie North region, are not "economic places" in the western economics[56]. This point is re-enforced by Robert Miller in "Establishing Economies on Indian Reservations," (2021) when he states:
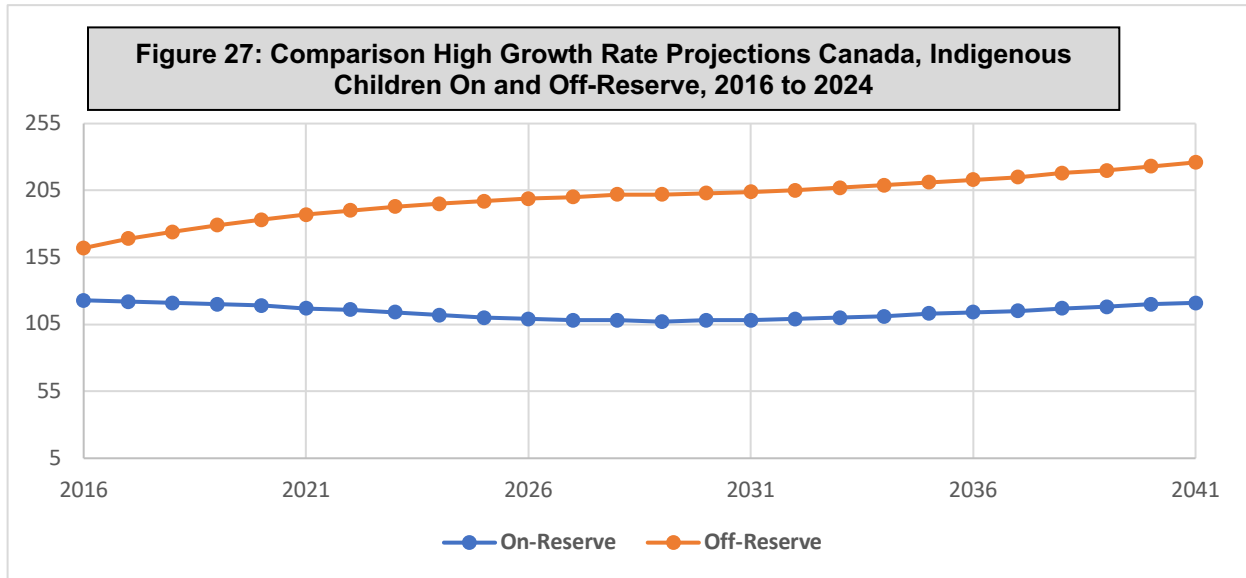
> *Few of the 300 Indian reservations in the United States have functioning economies in which reservation residents can be employed, spend their money, and find adequate housing. As a result, almost all reservation residents have to travel to distant cities to find banks, businesses, higher education, and jobs. This situation helps state economies but serves to impoverish reservations, where Native people disproportionately live in poverty.[57]*

Less research is available on the on-reserve and Northern Indigenous population, which may be a factor of the limited economies in these regions, the limited penetration by researchers into these communities, as well as the impact of out-migration of its members for education and jobs, leaving hollowed out communities with "left-behind" people. Population projections suggest that this number has grown to between 404,000 to 406,000 in 2022, representing around 40% of the Indigenous population in Canada. Projections through to 2041 indicate that some 500,000 people could be living on-reserve using the higher projection scenario.

While youth currently number some 114,000 to 116,000 in the on-reserve population, their percentage of the population will begin to decline over time, to 91,000 at the low projection to 122,000 at the highest projection. This is because the on-reserve population is aging, and younger Indigenous families are moving off-reserve. Using the high growth scenario, Indigenous children (ages 0-14) living On-Reserve as a percentage of the total population will drop from 31.1% to 24.4% between 2016 and 2041 (Figure 27). The low growth scenario could see Indigenous On-Reserve children as a percentage drop to 20.2%. On the one hand, this provides some relief to government programs delivering educational programming to on-reserve communities, allowing more resources per individual to improve the quality of education. On the other hand, this means that Indigenous children living in census metropolitan areas (CMAs), off-reserve, and outside Inuit Nunangat will increase from 162,000 to 226,000 (based on the high growth scenario); more resources will need to be expended into urban and off-Reserve settings in which Indigenous communities may have less control over.

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[56] Robert M. Bone (2003) The Geography of the Canadian North: Issues and Challenges, Toronto: Oxford University Press. pp: 186-187.
[57] Miller, Robert J. (2021) "Establishing Economies on Indian Reservations" *The Regulatory Review*, Opinion, April 6, https://www.theregreview.org/2021/04/08/miller-establishing-economies-indian-reservations/

Figure 27: Comparison High Growth Rate Projections Canada, Indigenous Children On and Off-Reserve, 2016 to 2024

One means of increasing teaching time and literacy/numeracy/problem-solving skills may be for the Federal government to provide contracts for early learning and learning recovery programs to First Nation education consulting firms with programs then being run On-Reserve, by First Nation educational mentors. This would give Canada greater input into the program delivery and teacher training while at the same time supporting local First Nation programming and content control/linguistic and traditional knowledge content as well as supporting local entrepreneurship.

The new Statistics Canada Remoteness Index measures the proximity to centres of economic activity, and accounts for the size of the population agglomerations, as well actual travel costs by different modes of transportation and their seasonal availability. A comparison across Indigenous groups reveals that Inuit communities have the highest median remoteness index across all the three distinction groups. Compared to First Nations, the median index of Inuit communities is about 40 index points higher, and about 50 index points higher compared to non-Indigenous communities. This comes as no surprise since approximately three-quarters of the Inuit population is in northern parts in Canada, with limited access to road networks. In fact, 38 out of 46 Inuit communities are accessible only by air transportation. When looking at how remoteness varies among communities, it becomes apparent that there are much greater differences between Indigenous communities than non-Indigenous communities.

The standard deviation shows the distribution of remoteness index of communities. By this measure, the smallest variation in remoteness index is found in Inuit communities with standard deviation of 0.146 index points. Once again this is not surprising, as most

of the Inuit population is concentrated in specific regions in Canada. First Nations communities has the highest variation of the remoteness index (0.18). Figure 27. Standard deviation of remoteness index by Indigenous group and non-Indigenous population, 2011 Median Mean Standard deviation: First Nations 44 0.46 0.18 Inuit 85 0.78 0.146 Indigenous 45 0.47 0.19 Non-Indigenous 32 0.32 0.15.[58]

More accessible Indigenous communities have higher levels of well-being, as shown by the correlation between the remoteness index and community well-being (Figure 28-29). The same holds for non-Indigenous communities, although in this case, the association is stronger: the correlation between community well-being and remoteness is relatively small for Indigenous communities (-0.30), and moderate in the case of non-Indigenous ones (-0.38). The comparison between remoteness and community well-being also makes evident that Indigenous communities have high level of remoteness associated with low levels of well-being at levels not observed for non-Indigenous communities. In other words, there is no non-Indigenous counterpart in terms of the most remote Indigenous communities and communities with the lowest levels of well-being. Similar trends can be observed, when looking at the correlations between CWB and RI within Indigenous communities.

Both cases show a negative linear relationship (Figure 28-29). One of the most common statistical measures of statistical relationships (the Pierson's coefficient measure) reveals a moderate correlation for Inuit and First Nations communities (-0.34 and -0.36 respectively). In terms of median distance to the closest city, the average median travel time to the closest city in predominantly rural remote regions is 514 minutes. However, travel time does not provide an adequate measure of proximity when comparing communities having no or limited access to the road network with those connected to the main road network. For instance, the northernmost territory Nunavut is not connected to the mainland by roads and therefore the only option to travel is by airway or sea. Air travel in the north is expensive and often disrupted due to weather conditions in the winter months.

Miller (2021) notes that one way of increasing On-Reserve business initiatives in the USA is for the U.S. Congress to better support the 1910 Buy Indian Act which seeks to promote Indian industry whenever practicable. The Act provides the Secretary of the U.S. Department of Interior with considerable discretion when it comes to spending federal

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[58] Notes: Data for Indigenous Communities excludes Métis Communities. The concepts and methodology of the remoteness index are presented in the following working paper: Alasia et al. (2017[58]). Source: Elaboration based on data provided by Statistics Canada on 27 September 2018.

funds on Indian labor and Indian-made products. Canada has a similar program with Industry Canada's Procurement Strategy for Aboriginal Business. Industry Canada has

Figure 28: Community well-being index and index of remoteness 2011, by ethnicity
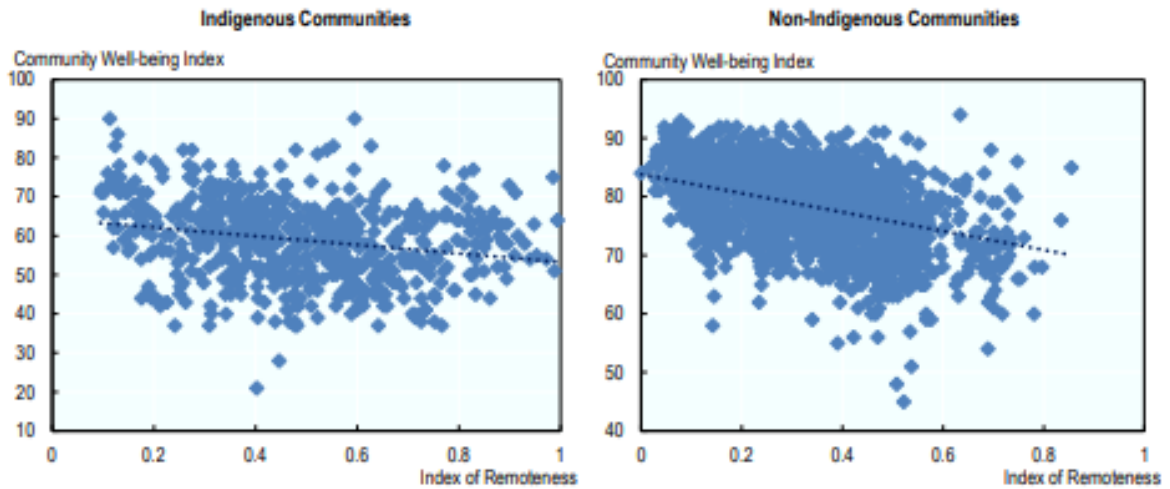
Notes: Data for Indigenous Communities is excludes Métis Communities. The concepts and methodology of the remoteness index are presented in the following working paper: Alasia et al. (2017[58]).
Sources: Elaboration based on data provided by Statistics Canada on 27 September 2018; Indigenous and Northern Affairs Canada (2019[49]), *The Community Well-Being (CWB) Index*, https://open.canada.ca/data/en/dataset/56578f58-a775-44ea-9cc5-9bf7c78410e6 (accessed on 19 September 2018).

Figure 29: Community well-being index and index of remoteness 2011, by Indigenous group
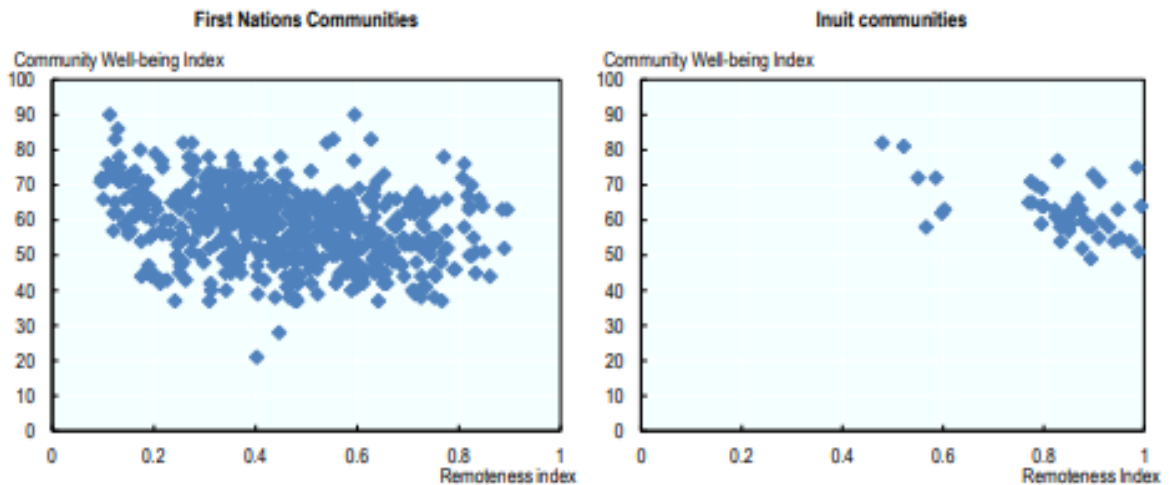
also established an Indigenous Business Directory which allows business to register their services and products with the Government of Canada.[59]

3.13   Gender and differences in Indigenous education and employment

Social inequality based on gender also persists among the Indigenous population (Haan et al., 2020). Haan et al. premise their work on the "'cultural devaluation' perspective: women, and their work, are devalued in the labour market due to the prevalence of gender roles, norms, and expectations; women are simply paid less for similar work". For example, Schirle and Sogaola (2020) note that women's hourly wages in the private sector were 27% less than men's in 2000, with the gap narrowing to 19 percent in 2019. In the public sector, wage gaps tend to be much smaller: Using LFS data, they found women's hourly wages in the public sector were 12% less than men's in 2000, and 8% less than men's in 2019. Finnegan (2014) though, found considerable income gaps between civil servants employed in the Aboriginal versus the provincial and federal government services sector. Between 2002 and 2012, the gap between Aboriginal government wages and the average for all governments wages in Canada fluctuated from -42% to -39%, showing a slight improvement overtime (Finnegan 2013). Aboriginal governments across Canada account for some 61,000 to 64,000 employees monthly in 2021 and 2022, with the general perception being that women represented the majority of those employed in Aboriginal government.[60] The wage gap is clearly defined in Schirle and Sogaola's (2020). Gender is clearly still a crucible in which legislated workplace equality has yet to change the formula for equity in employment with white women at -30%, visible minority women at -17% and Indigenous women running -44% (unadjusted) of Canadian-born, white male incomes as of the 2016 Census.

Hann et al. manipulate data from the Aboriginal Peoples Survey (APS) to test the factors that predict the income of Indigenous women. Their first model tests the main effects of the key predictors of gender, education, and employment characteristics. Their second model adds an interaction effects between industry, skill level, education, identity, number

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[59] See Government of Canada, Procurement: https://www.sac-isc.gc.ca/eng/1354798736570/1610985991318 and business directory: https://www.sac-isc.gc.ca/eng/1100100033057/1610797769658

[60] Statistics Canada. Table 14-10-0201-01 Employment by industry, monthly, unadjusted for seasonality. https://doi.org/10.25318/1410020101-eng

of children and gender, to determine how these factors can cause income to vary between men and women. Ultimately, they found that although males and females earn nearly similar income in some industries, such as wholesale trade, real estate, administration, and education services, males, on average, earn more than females across all industries. In addition, by accessing data through the APS, Haan et al (2020) can link income and education to "sense of belonging in Aboriginal community." They found that:

> *Generally, a sense of belonging to the Indigenous community is also found to have a link to income. Those who strongly disagree with the statement that they feel a sense of belonging to their Indigenous community earn more income, relative to those who strongly agree that they do.*

This may be because many Indigenous women move away from their home communities, especially remote reserves, to access higher education, training programs, and jobs that enable them to earn higher incomes. They conclude that it is not just social isolation but the social distance from mainstream society and attachment to less powerful groups that may be contributing to lower income. Indigenous peoples' social distance from the mainstream labour market, and its negative impact on income, sheds light on a system that tends to reward those that are less attached to their communities, spurring attitudes of detachment (Haan et al 2020).
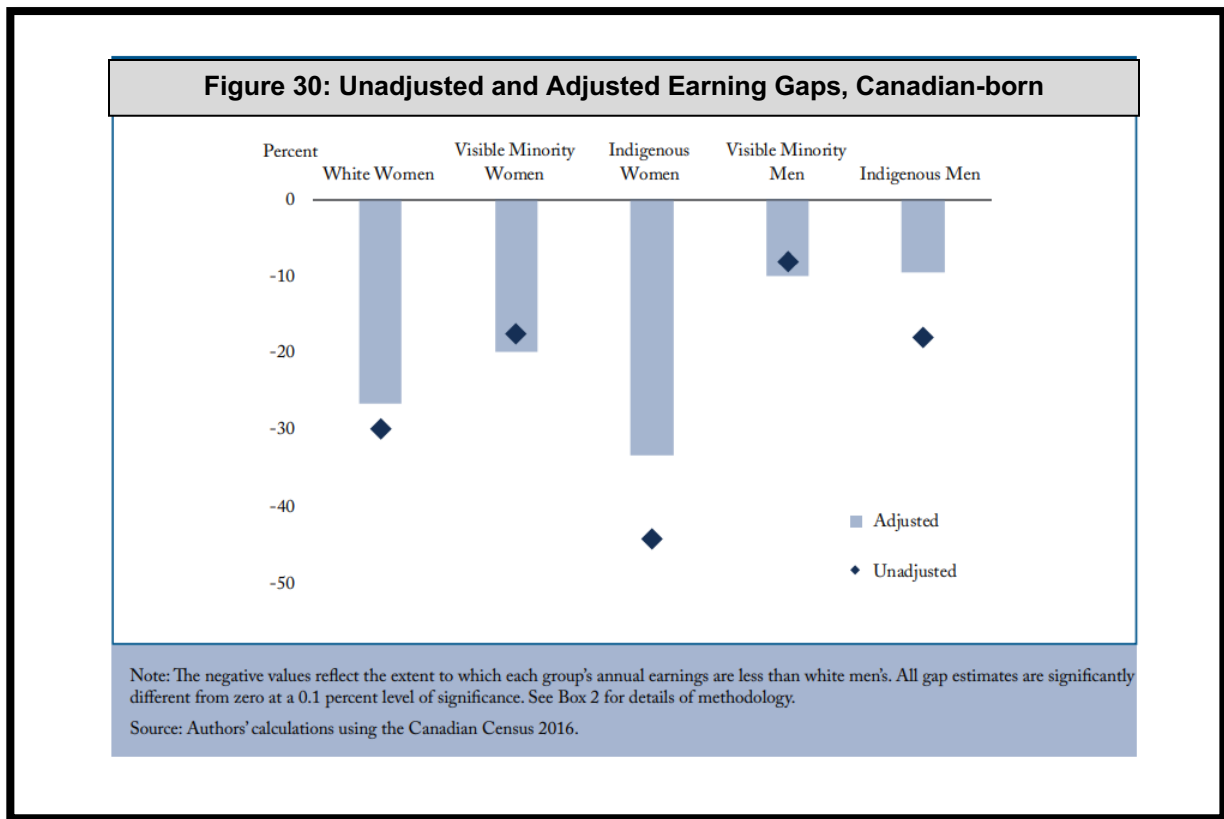
Bleakney and Melvin (2022), reporting on findings from the 2021 Census of Canada, discuss the overrepresentation of Indigenous women and girls in the remote regions of Canada.[61] Their findings stress gender issues coupled with those of geographic remoteness and isolation, and in some ways mirror the findings of Haan et al (2020). These findings include:

- Indigenous women and girls are more likely than their non-Indigenous counterparts to live in areas farther from large population centres.
- Indigenous women and girls accounted for nearly three-quarters (72%) of the female population living in very remote communities in 2016.

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[61] Statistics Canada's remoteness index (RI) was used to quantify the extent to which a census subdivision (CSD) is remote, or far from neighbouring population centres. To develop the RI, researchers used data from official statistical sources, including census data, in addition to data from non-official statistical sources, such as Google Maps API. For each CSD, the RI value was determined based on the CSD's relative proximity to all surrounding population centres within a radius that permits daily accessibility (measured in travel cost), as well as the size of those population centres (measured in population size). See: https://www150.statcan.gc.ca/n1/en/catalogue/17260001
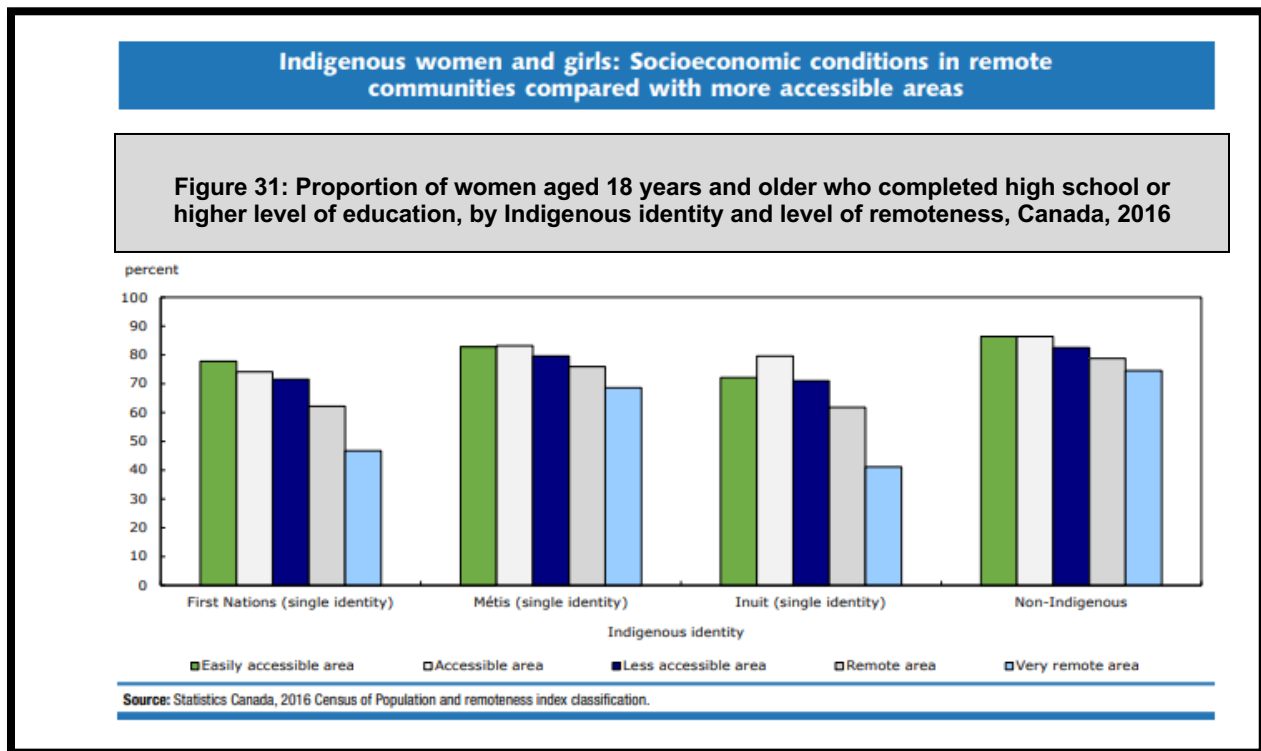
Indigenous women and girls living in more remote areas more often face challenges and barriers that affect their socioeconomic well-being than those living in accessible areas, according to a new study. In addition, a key finding is that they are less likely to have completed high school or to have obtained a higher level of education. However, interestingly, educational attainment declined with increasing remoteness among First Nations, Metis and Inuit women.

Figure 30: Unadjusted and Adjusted Earning Gaps, Canadian-born

Note: The negative values reflect the extent to which each group's annual earnings are less than white men's. All gap estimates are significantly different from zero at a 0.1 percent level of significance. See Box 2 for details of methodology.

Source: Authors' calculations using the Canadian Census 2016.

For example, approximately 4 in 10 Inuit women living in very remote areas had completed high school or a higher level of education (41%), compared with more than 7 in 10 of those living in easily accessible areas (72%). The delivery of effective, equitable programs in small, remote communities where there are few resources, limited internet connectivity, and lower levels of competency in literacy, numeracy, and problem-solving is a major and ongoing challenge for educational and training programs. These are generally communities with younger populations, more children, and a greater demand for childcare and early learning programs. These remote communities remain the hearth of Indigenous languages in Canada with Inuit women and girls, in remote (60%) and very remote (83%) areas being ten times more likely to speak an Indigenous language than those living in less accessible (10%) and accessible areas (8%). In comparison, still over

half (57%) of First Nations women and girls in very remote areas could speak an Indigenous language, compared with only 7% of their counterparts in easily accessible areas.

Hirshberg and Petrov (2015), writing on Pan-Arctic educational trends for the *Arctic Human Development Report 2014,* recognize that "the feminization of human capital is a rather new phenomenon"*,* these authors find that Indigenous women still lag behind most groups in society for access to educational opportunities, for career development and for equality of income and that isolation both socially and geographical hinder their opportunities.

Indigenous women and girls: Socioeconomic conditions in remote communities compared with more accessible areas

Figure 31: Proportion of women aged 18 years and older who completed high school or higher level of education, by Indigenous identity and level of remoteness, Canada, 2016

Source: Statistics Canada, 2016 Census of Population and remoteness index classification.

While not addressing Indigeneity, Reiter's (2022) international study of the changes in literacy skills as cohorts age is a significant finding and one that needs to be applied to the Indigenous framework moving forward. He states: "Results suggest significant heterogeneity in the pattern of changes in literacy skills with age, reflecting the differential exposure to cognitive stimulation over the life course and suggesting that the development of skills in a country is also the consequence of a changing composition of its population. Gender, however, was found to have hardly any effect on how literacy skills evolve between the ages of 15 and 65. On the aggregate level, findings reveal

considerable differences between countries – regarding both the level of skills and their development over time. Overall, it was found that massive educational expansions happening globally in the recent past only partly resulted in a corresponding rise in skills." These findings suggest that quality over quantity (or years of added education in school) is more important, supporting the finding of Egert et al. (2022) above.

Last, Feir et al. (2021) evaluates the distributional impacts of active labour market programming for Indigenous populations using administrative data and an empirical strategy that compares participants in high-intensity programs – skills interventions, job-creation partnerships, or wage subsidies – to those in low-intensity programs, such as employment assistance or job counseling. They found large returns to high-intensity programming for above-median earnings. They conclude that returns are largest for women at the mid-point in terms of earnings suggesting that high-intensity programming may reduce gender gaps in earnings among participants.

3.14 Indigenous governments and economic development corporations as Labour Force training grounds

According to the OECD, well-informed Indigenous-delivered and Indigenous-led employment training is a critical element for improving Indigenous labour-market outcomes. Indigenous governments and economic development corporations are making large workforce contributions, especially in northern areas, due to a radically different approach to their workforce management.

Through Key Informant Interviews (KII,) several important Indigenous perspectives regarding self-government, the digital divide, and education were captured. One KII noted:

> *[There are] three things we need to move on. First, self-determination is the key... Self-government would actually bring the money over the communities under the red tape. Second, the digital divide. We will not be able to build our nations and implement our agreements and support self-determination if we don't get this digital divide under control. It's just it's getting worse and worse and worse. I'm always concerned about our kids in K to 12... they're not getting any computer training at all because the programs are being built with the assumption that they have access to reliable internet and that they understand and have devices. And that's not the case. [Third,] for some teachers, it's so tough to learn, while some teachers have really excelled and they've got websites for the kids to go on, and they're finding videos for the kids to use. They connect with the kids. You know, my daughter's teacher connects with her once*

a week or once every three days. My son's teacher he hasn't seen since October.

There is a dearth of academic literature on the role of self-government under the Indian Act to date. Finnegan broached this subject in 2014, in which he

Figure 32: Change 2002-2013 in Aboriginal Public Administration Employment					
Geography	**North American Industry Classification System (NAICS)**	**2002** **Total**	**2013** **Total**	**Change 2002-2013**	***% Change 2002-2013***
Canada	Aboriginal Public Admin	41,020	51,361	10,341	*25.2%*
Yukon	Aboriginal Public Admin	981	1,551	570	*58.1%*
NWT	Aboriginal Public Admin	603	585	-18	*-3.0%*
Finnegan, 2014					

produced descriptive statistics derived from the Survey of Employment and Payroll Hours (SEPH) to assess the high level of self-government employment in Yukon in comparison to the rest of Canada. Finnegan documents the importance of Indigenous self-government as an employer, with some 1500 to 1600 jobs a year in an economy of about 20,000 jobs in total. The paper looks at the value that Indigenous self-government wages contributed to the Yukon economy, which was around 3.1% of its GDP in 2012. Employment in Aboriginal government, however, does not just include Indigenous employees, but also staff hired from the Newcomer Society. Between 2002 – the first years of self-government in the Yukon – to 2013, Aboriginal Public Administration as an employment category increased by 58.1%, more than double the rate of increase across Canada (Figure 32).

Notably, many of the jobs in self-government held by Indigenous employees were entry-level, with limited salaries. Nonetheless, they represent career development opportunities for Indigenous workers in their own communities and help advance self-determination by promoting participation in the management of their communities. These positions also often include benefits and opportunities for training and skills upgrading, meeting people from outside the community, participating in meetings, and creating a sense of belonging to an organization that has a purpose and mission. Opportunities for acquiring new skills, or for taking certificate or degree programs are decisions taken locally by administrators who they know and who live and work beside them, not mandarins in far off regional or national government offices. The importance of self-government as a training ground for Indigenous employees or the mobility of these workers within their own government or transitioning into other roles in the public or private sectors is an obvious topic for future research. As one of our Indigenous KII states:

So, what training and education systems are broken? I think the actual fundamental one that we have control over, that can instigate change is self-government, I mean, self-government is actually helping that process a lot. Yeah, absolutely. I think you can see a direct connection between more effective Indigenous training programs and increased self-determination.

The line blurs between First Nation government and development corporations and community development programs. It is not uncommon for the Chief of a First Nation to also be the CEO or Chairperson of the development corporation or at least sit on its board. Some chiefs are even active businesspersons in the community. These are often small remote places with limited resources and a limited pool of entrepreneurial and politically active individuals. More research needs to focus on how these "joint operations" function, and how they may act as a stimulator of good governance where political decision making and business logic can work together to avoid mixing political needs with personal profit. Gladun, Nysten-Haarala and Tulaeva (2021) explore how the development of Indigenous communities in the Arctic is linked to their economic well-being, on the one hand, and to their culture and traditions on the other. They are particularly interested in how political and communal strategies can be employed for preserving unique Indigenous economies. This is a unique element of their work as most studies in the field of Indigenous economic development are looking at ways and means by which First Nations can adapt to western economic opportunities or create businesses around Newcomer Society investment in natural resources. It is almost an *a priori* assumption in the literature that there was no Indigenous economy per se prior to western/settler investment arriving.

Indeed, the role of Indigenous development corporations in local training and skills development is less clear and less systematically examined than that of self-government. The Canadian Council on Aboriginal Business (CCAB) has produced several survey-based reports that delve into Indigenous organizations' deep databases developed over years of interviewing and tracking Aboriginal business in Canada. The starting point of their research is that the Indigenous population is young and fast-growing. Between 2016 and 2026, 350,000 Indigenous youth will turn 15, the age at which they become potential members of the workforce. Taken with the aging Newcomer population, Canada's young Indigenous population is a potential source for labour force renewal. CCAB (2020) notes that while Indigenous firms are major employers of Indigenous people, they are often concentrated in sectors that face disruption. Their data shows that business operators cite unfavourable business climates on-reserves, and would-be Indigenous entrepreneurs have difficulties accessing capital. Gaps in Indigenous education and skills-training presents both a labour and business problem: Indigenous firms say finding capable staff is difficult; labour market growth is threatened if action is not taken to upskill prospective workers. Indigenous skills training programs need the following to reach their fullest potential:

- an ability to support youth through earlier intervention and pre-employment training,
- programming for clients to upgrade essential skills before they reach pre-employment training; and
- affordable, accessible childcare.

Other studies have shown that the likelihood of success increases when training is culturally appropriate, engaging in land-based training, and inclusive of wrap-around support. Current federal skills and training programs have not yet systematically addressed this challenge; one independent study found that data was not collected on program success, rendering the most effective programs no more likely to be supported or renewed than the least (CCAB 2020).

Significant proportions of jobs go unfilled in parts of Canada with high Indigenous populations. For example, in Nunavut, 28% of Inuit are unemployed, compared to three percent of non-Indigenous people. At the same time, significant proportions of public services jobs in these regions are unfilled. For example, in the government of Nunavut, public services jobs in health recruit to only 55% capacity, and community and government services to 62%, with the average across all departments being a 71 % recruitment rate, leaving 29% of all jobs unfilled. More than half (52%) of unemployed Inuit also said that not having enough education or training for available jobs had caused them difficulty. This was highest in Nunavut (60%). An extensive economic literature discusses they mismatch between supply and demand and in Canada that mismatch is often exasperated by geography and the skills gap between the Indigenous and non-Indigenous.

CCAB's concluding questions are worth reviewing as they are speaking from a well-informed, albeit rich, privately controlled longitudinal database:

- Given that half of status First Nations live on reserve, business and economic development opportunities need to be tailored to address or integrate with existing infrastructure and skills situations.
  - How can business growth and economic opportunities be brought to, and function, in remote communities? (Especially given the restrictions on capital and lending in On-Reserve financial settings?)
- Will the Indigenous-led economy, and/or business sphere, look like the broader Canadian economy?
- How can skills-training be designed to best facilitate knowledge transfer for Indigenous peoples?
  - Additionally, what aspects of skills-training practice can be generalized from the non-Indigenous skills ecosystem, and what aspects need to be tailored for the Indigenous skills ecosystem context?

- o Further, what aspects must be customized for the different needs of specific Indigenous groups, e.g., for Inuit in Inuit Nunangat, for status First Nations living Off Reserve, etc.?
- What measures can we take to ensure current policy and funding environments are adequately supporting Indigenous education, training, and entrepreneurial development?
- What employee-side practices need to be in place to ensure that Indigenous workers experience a bias-free, culturally safe workplace, and what can non-Indigenous business operators learn about these practices from Indigenous-owned businesses?

Berge (2020), in a paper on the Co-operative movement and northern stores, argues that the co-ops are in a symbiotic or closely inter-related role in the communities. In summing up his perspective on the role of the co-ops in Indigenous business development in remote communities, he notes:

- There is a link between the community and the co-operative that needs to be encouraged and developed to keep the benefits of economic activity in the community.
- Skills training needs to be developed in order to increase the capacity of community members to meet the co-operative's growing need for business acumen.
- Skills training needs to include a cultural component so that individuals who work for the community co-operative, a key part of the community, understand the community.

Arctic Co-operatives Limited is a Winnipeg-based corporation that actively promotes the idea of member-owned commercial enterprises that redistribute profits to beneficiaries. In contrast there are few Arctic Co-ops in Yukon, although some First Nations own a community store. The Yukon community consumer price index survey uses Old Crow as an outlier example and clearly the data brings into question the value of the co-operative movement in the village. Old Crow is the Yukon's only fly-in only community and compared to Mayo or Dawson, which are, while remote, on highways, its consumer price index is almost twice as high. Berge fails to comment on the much higher prices the Co-op in Old Crow charges compared to stores in relatively remote Mayo (122.5) or Dawson (121.3) the prices index for Old Crow were as high as 209.8 (with Whitehorse = 100,

October 2018).[62] Finally, the researcher fails to investigate the role of the Co-op in developing or failing to develop managers from within the community. In many communities the Co-op has been active for 25-years or more; however, have they developed an Indigenous management team or are they speaking in platitudes? No evidence is provided on the number of Indigenous community members who have graduated from staff to management.

In a more balanced analysis, Proulx et al. (2020) analyzes the "Untapped potential? Attitudes and behaviours of forestry employers toward the Indigenous workforce in Quebec, Canada." The authors recognize that a skilled labour shortage in the natural resource sector is a major issue in the Canadian forestry sector. Quebec alone has 15,000 positions to fill by 2022. He notes that at the same time, many Indigenous communities are seeking employment opportunities, as they have high unemployment rates and a young and growing population. They ask: *are forestry employers creating an environment conducive to the recruitment, integration, and retention of an Indigenous workforce?* Through an interview process with twenty-two directors and managers of human resource departments, of whom only three were Indigenous, they discovered that:

- Employer have only just begun to see the potential of the Indigenous workforce and put in place diversity management practices.
- Partnerships between Indigenous communities and forestry businesses, development of alternative training and skill development methods are key,
- Awareness-raising among employees and employers were found to favour recruitment, integration, and retention of Indigenous workers.
- Stereotypes, discrimination, lack of inclusion measures, drug and alcohol use, and lack of training reduce the potential for Indigenous people to join the forestry workforce.

Proulx et al (2020) note that in forestry, few businesses have a strategy or policy for engaging Indigenous groups, and minimal financial and human resources are generally dedicated to the recruitment and retention of Indigenous employee. They state that:

> *For a diversity management policy to be effective, it must be accompanied by clear commitments in terms of human and financial resources; therefore, the support of senior management is fundamental. Moreover, partnerships with*

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[62] See Yukon Bureau of Statistics https://yukon.ca/sites/yukon.ca/files/ybs/fin-consumer-price-index-2018.pdf

Indigenous communities can help businesses attract Indigenous workers, although the empirical evidence is scant.

While both Berge (2020) and Proulx (2020) discuss the role of industry in Indigenous business development, they skirt what should be an essential aspect of the interface between Newcomer Society industry and the Indigenous communities they are looking to work with, which is improving the business and educational skills of the people living in these communities.

The issue of soft skills is broached by a couple of researchers as a means of improving employability, especially in job recruitment and retention. Bartel (2018), while not speaking directly to Indigenous issues, explains that deficiencies in certain soft skills can be part of a cultural literacy gap. She raises the issue of four soft skills that can influence employers:

- handshakes,
- willingness to engage in small talk,
- making small talk (to build rapport), and
- asking questions.

She concludes that there are many other speech acts and non-verbal behaviours representing soft skills for employability, such as turn-taking in meetings while speaking, interrupting, apologizing, opening/closing e-mails, requesting, and so on. (A lesson on requests in an Australian health workplace can be found in Yates and Springall [2010], for example.) Bartel notes that: "job interviews are social interactions in which there is a power difference between the two interlocutors: the more powerful interviewer, representing the institution (company), and the less powerful candidate, who less often has (or takes) a chance to steer the conversation".

Bell (2017) also touches upon the role of soft-skill training, but in a radically different light. She discusses how the diamond mining industry instructed Indigenous workers in the Northwest Territories on how to speak about their work in the mines and the work they undertake to support the ethical diamond trade. In her fieldwork, Bell met 12 Indigenous adults enrolled in *Ready for the Job,* a two-week state and industry-subsidized two vocational training course to become underground diamond miners. *Ready for the Job* focuses on soft skills over technical industrial know-how. In this groundbreaking study, Bell recognized that the diamond industry was actively bringing the Indigenous labour force into the workforce in order to meet their commitments to Indigenous communities and to improve their national profile. A local labour force reduces travel expenses and generates local goodwill, but the acceptable Indigenous worker had to meet specific requirements as Bell notes:

Ready for the Job included personality tests, learning-style inventories, and communication style quizzes that all aimed to provide trainees with acceptable ways of knowing and expressing themselves. Part of the program was to help trainees see themselves, and thus speak about themselves, differently. Trainees needed new visions (or likely, versions) of themselves if they wanted to be "set for life." The assumption here is that Indigenous people do not know about themselves, nor how to talk about their "potential." Said differently, they are unable to prioritize their capacities as labour in everyday speech acts.

Bell critically concludes:

The promotion of soft skills in the context of mining hard rocks cannot fully be understood as merely a poor attempt to produce ideal workers, although it is that too. Diamonds from Canada, marketed as ethical commodities, require would-be workers as much as they need laborers in the pits.

The underemployed are crucial to the promotion of diamonds as development. The register of readiness mediates the contradiction of unpredictable job promises by recasting dried-up opportunities as "opportunities to exercise patience" and thereby thwart trainee critique and maintain the brand reputation of Canadian diamonds locally and globally.

Bell (2017) demonstrates not only the failure of the training programs, but the western corporate spin that the failure was theirs, not ours, and in attempting to do our best as an industry "we" should be rewarded with the highest ethical standards. How can the lessons Bell exposes on the hypocrisy of ethical diamonds and Indigenous training programs in NWT be used to create better programs that address the cultural divide between Indigenous communities and western commodity production driven corporations and their spin doctors?

Hall (2021) is no less critical of the role of government and the diamond mining industry in subverting Indigenous labour. As she states: In the NWT, local Indigenous people are targeted for employment because of an attachment to place: the place of extraction. Employment targets, used as a marker of responsible development, have varied between mine and through operation phases; however, targets for northern hires have been at least 50%. The most recent northern hire targets for mining operations in Ekati and Diavik, the two longest standing mines, were at 62% and 66%, respectively. Indeed, throughout operations, from 1996 to 2016, including of all mine phases, northern Indigenous people have made up a cumulative 24% of the mining workforce, with northern hires resting at 51%. Because of the FIFO structure of the diamond industry, northern Indigenous populations do not fit the traditional role of a regional population supplying the immediate place-based need for a local labour force. Hiring northerners and sub-contracting

Indigenous businesses means cheaper transportation costs and local experience and expertise with the land. However, the larger imperatives for Indigenous hires driving both the federal and territorial governments, as well as industry, is the equation of "responsible development" – or, in this case, the very lucrative branding of ethical diamonds (Bell, 2017) – where corporations commit to consultation and development with Indigenous communities.

Hall quotes Bell (2010) in concluding that "while Indigenous people have used these training-recruitment programs to gain new skills and secure lucrative employment, they also play the role of legitimizing 'unequal divisions of labour', and, I would argue, more broadly, the colonial dispossession requisite for extraction on Indigenous land, 'while allowing the state to appear neutral in the reproduction of inequality.'"

Finally, Indigenous communities are starting the process of transitioning from dependency on diesel power to a blend of renewable energies such as solar and wind. These renewable power projects can provide skills and job training opportunities with renewable suppliers and developers, as well as pathways to reconciliation, climate change mitigation, while delivering local and community benefits according to Hoicka, Savic and Campney (2021) explores 194 renewable energy projects associated with Indigenous communities and concludes that one pathway to reconciliation is equity ownership, which they note has risen over time, although most projects located on traditional territories and Indigenous communities generally have minority or no ownership. Renewable power projects do not just reduce dependency on old carbon emitting technologies; they speak to an Indigenous ethos while also potentially creating jobs and new revenue streams for the community is they can sell into a grid, which is usually not always the case in northern remote communities.

3.15 Crime and addictions as lost labour force opportunities

Chartrand (2019) provides a comprehensive overview of the role of incarceration as a tool of the neo-colonial state to enforce policies that continue to limit and curtail the rights

of Indigenous people in Canada. She notes that Indigenous peoples are overrepresented in the Canadian criminal system, likening today's prisons to yesterday's residential schools.

In 2018/19, Canada had 37,854 people in its federal/provincial/territorial jails. This represents a rate of incarceration of 12 per 100,000 people, with Indigenous adults accounting for 31% of admissions to provincial/territorial custody, and 29% of admissions to federal custody. Meanwhile, they represented approximately 4.5% of the Canada's adult population.[63]

Indigenous women represent the fastest growing prison population in Canada; they represent 42% of all incarcerated women in Canada. . Authors McGuire and Murdoch (2021) apply the notion of genocidal carcerality to the intersectional forces of systemic racism and discrimination that result in their overincarceration.[64] Their critical commentary utilizes a decolonial framework to examine how being Indigenous and female increases one's risk of being victimized, murdered, and subject to colonial control. They explore the connections between the construction of Indigenous women as less than human, and the use of carceral space to control, destroy, and assimilate this population. They recount the story shared by Donald Meikle, the Executive Director of Saskatoon Downtown Youth Centre Inc.:

An Anecdote from a government research program

In 2008, a researcher was commissioned by a Minister of Justice to oversee a highly confidential research program on the lives of a cohort of people serving non-federal prison terms. This group of some one-hundred men were all Indigenous and were almost all from local First Nations. As such, government had access to their earliest records, from, in most cases, birth, to their first contact with social services, to grade school, to their first contact with the police and the criminal courts system. A vetted third party was in charge of collating and reporting on the material and as such the researcher never read any of the individual files. The results in brief are most had dual diagnostics challenges, mental health issues and learning challenges including fetal alcohol syndrome, combined with drug/alcohol addictions, low educational attainment, problematic familial scenarios and homelessness, a life of almost continuous incarceration for petty crimes. The jail had effectively become a home for many with recidivism providing guaranteed housing.

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[63] Malakieh**,** Jamil, (2020) Adult and youth correctional statistics in Canada, 2018/2019 Canadian Centre for Justice and Community Safety Statistics, https://www150.statcan.gc.ca/n1/pub/85-002-x/2020001/article/00016-eng.htmhttps://www150.statcan.gc.ca/n1/pub/85-002-x/2020001/article/00016-eng.htm

[64] This concept is part of the study of "criminology of genocide through examination of settler colonial destruction within the broader context of what we term 'genocidal carcerality'. The authors employ this term to examine the ways in which space is implicated in the physical, biological, and cultural destruction of group life." Woolford, A., & Gacek, J. (2016). Genocidal carcerality and Indian residential schools in Canada. *Punishment & Society*, *18*(4), 400–419. https://doi.org/10.1177/1462474516641375

It often reminds me of the story of the two people pulling dead bodies from a river. They stood strong, pulling bodies day after day, until an Elder happened to walk by and asked them what they were doing. They explained what they were doing … The Elder looked at them and asked, "Has anyone gone upstream to find out why all these bodies are coming down in the first place?" When we're looking at Indigenous women's issues, we still continually look downstream.

Against this backdrop, there is a need to support applied research on the development of programs that can reduce the risks of Indigenous people "upstream" through improved education, and downstream, find ways to ensure that their current period of imprisonment is their last and that they have access to the life-skills programs, fundamental educational services, and the training that they need to break the cycle of criminality.[65] McGuire and Murdoch (2021) note of a lack of current programming, and the tendencies of singular Indigenization within the prison system which leads to all Indigenous prisoners being treated homogeneously.

Renbarger, Rivera, and Sulak (2019), in their PIAAC premised research paper on incarceration and education in America, note that participation in correctional education increased literacy and numeracy ability (Rampey et al., 2016), while Vacca's (2004) research found that teaching reading and writing skills to offenders could reduce recidivism rates.[66] Offenders who participate in educational programs may gain problem-solving skills, leading to better reassimilation once released. An insight from Renbarger et al (2019) is that:

Problem-solving abilities may be negatively impacted by specific traits or states, such as fatigue, anxiety, stress (Jonassen, 2000), low self-efficacy, low self-esteem, or self-criticism (Heppner, Reeder, & Larson, 1983). Moreover,

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[65] One possible line of enquiry may be to document the educational challenges that Indigenous people before the courts have faced which are captured by Gladue Reports. If you identify as Indigenous and are charged with a crime, the judge must apply Gladue principles when in a criminal court. Gladue principles are a way for the judge to consider the unique circumstances (experiences) of Indigenous peoples. These unique circumstances include the challenges of colonization you, your family, and community faced and resisted as Indigenous people, and continue to affect you today. These challenges include racism, loss of language, removal from land, Indian residential schools, and foster care. These challenges are called Gladue factors.

[66] In 2014, the OECD conducted a supplement to the data in the United States that focused on the prison population. This public-use supplement includes information about the former and current lives of United States prisoners

correlational research has suggested that individuals who score lower on instruments related to self-concept and beliefs also score lower on inventories of problem solving.

Renbarger et al. (2019), using Bayesian modeling, found that computer use was positively associated with literacy and numeracy scores, yet most prison institutions limit the amount of access to computers and internet (Davis et al., 2013). Limits of technology use for safety reasons are important, but it is possible technology use may serve as a positive intervention for some inmates.

The Canadian literature appears to be rather silent on the degree of disadvantage that Indigenous Canadian face when they are dealing with the legal system. In the provocatively entitled article *The Degree of Disadvantage: Incarceration and Inequality in Education* Ewart, Sykes and Pettit (2014) explore how America's prisons and jails have become repositories for high school dropouts, obscuring the degree of disadvantage faced by black men. They found that nearly three in ten white male high school dropouts in the United States can expect to serve time in a state or federal correctional facility in their lifetime, and nearly 60 percent of black male dropouts are imprisoned at some point in their lives. This impacts just not the labour force, but also may skew socio-economic research results which exclude people residing in prisons. With such sizeable percentage of the less educated Black population incarcerated, this removes a major low income, low educational attainment population for the denominator of labour market or income studies. As Ewart, Sykes and Petti (2014) note:

> *If the exclusion of prisoners from such calculations biases estimates of educational attainment, a growing institution – prisons and jails – has obscured our understanding of one of the most basic measures of socioeconomic success and one of the key pillars of American democracy – educational attainment. Such an omission may have wide ranging consequences for sociological research and public policy. Furthermore, if the exclusion of prisoners leads to a misrepresentation of the educational attainment of the population, the findings will suggest that current frameworks for understanding the relationship among education, individual mobility, and American competitiveness require additional theorizing and greater empirical rigor because they ignore a salient institution in the lives of disadvantaged men.*

In a similar vein, Norris (2019), in a review of academic research on the incarceration of Indigenous women in the USA and New Zealand, concludes that the absence of a critical lens toward contemporary forms and experiences of racism undergirding the mass criminalisation of Indigenous people perpetuates a colour blindness that, in turn, normalises mass female incarceration. Even in attempts to be unbiased, the way race/ethnicity, gender, age, and class are discussed in academic research exploring

female incarceration seems to reflect the influential nature of controlling images rather than critique them. This research paper uses numerous examples of racism with the education systems which have lifelong consequences on social behaviour, with one quote stating out among many examples: Rata (2017), *in explaining the shortcomings of reframing racist practices as unconscious biases, discusses the findings of a Treasury report that compared Māori students' scores to teachers' assessment of them. The findings revealed that Māori and Pasifika children face unfair judgment by teachers who hold lower expectations of them.*

Could similar issues be skewing Canadian research on Indigenous people and their labour market/income/workplace outcomes? The Gladue process in the legal, court and prison systems might provide a guide to future approaches to employment and training. Considering family and personal experiences with colonialism as a means of determining eligibility for programs and/or work opportunities. In other words, does research provide skewed results, by oftentimes excluding Indigenous peoples living on-reserve, as well as those in prison from their sample? The Yukon Department of Education was caught on this exact issue in an 2008-09 Auditor General of Canada Report whereby it was reporting high school graduation rates using the "base-n" of the student cohort that entered Grade 12 against the leaving population of the same year. The "base-n" should have been as it is elsewhere in Canada, the student cohort entering Grade 10, not Grade 12. The graduation rate was inflated, yet still well below the national average.[67]

3.16   Health literacy, quality of life and well-being of Indigenous Canadians

Health literacy is recognized as a fundamental barrier to improving the quality of life and well-being of Indigenous Canadians and their communities, especially if health is increasingly being delivered through online services in remote communities. Rempel, Donelle, and Kothari (2016) define functional health literacy as the ability to access, understand, appraise, and communicate information to promote, maintain, and improve health across the life course. Rheault et al. (2019) provide a more detailed definition:

> *Health literacy far surpasses the ability to read and write and encompasses a wider array of competencies to manage one's health. Health literacy involves the*

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[67] Greg Finnegan was the Chief Statistician of the Yukon at the time of the report and was asked to correct the data produced by the Yukon Department of Education government staff and report back to the Deputy Minister for her reply to Canada. See: https://www.oag-bvg.gc.ca/internet/English/yuk_201906_e_43400.html

consultation, engagement and communication with healthcare providers and the journey of navigation through complex healthcare systems. Health literacy also encompasses the critical appraisal of health information from different sources, the social support needed to access services and maintain good health and understanding ones' rights as healthcare consumers. People with lower health literacy have less knowledge of their health problems, less knowledge on how to effectively self- manage, have lower uptake of health screenings, lower rates of engagement in health promoting behaviours, lower medication adherence, higher rates of hospitalization, experience 30-day hospital readmission after discharge, and have a poorer overall health status.

There are clear correlations between health literacy and an educated and productive labour force. This section reviews some research that links Indigenous literacy in Canada to health.

Hu (2019), in her doctoral dissertation, used PIAACV results to assess the labour and health outcomes of three groups in Canadian society. While the section on labour force outcomes is supports the general findings that: "relative to the non-Indigenous sample, this study finds negative earning differentials, lower information-processing skills, higher unemployment, lower employment, and labour market participation among Indigenous peoples. But of greater significance is her research on the diverging health of Indigenous males and females which uses data from the Aboriginal People's Surveys 2001, 2006 and 2012 shows that the self-rated general health gap between Indigenous males and females widened from 1.6 to 5.2 percentage point between 2001 and 2012." Could a better reading of PIAAC against the APS databases over time be used to assess any divergences between First Nation, Métis, and Inuit men and women over time on literacy and educational attainment?

A small-scale interview-based paper by Rempel, Donelle, and Kothari (2016) assessed the health status of eight single, First Nation mothers living on-reserve. They note that in a health care system that expects individuals to play an active role in promoting their health, literacy plays an essential role in promoting good health. Health literacy is even more imperative in remote and rural communities, where access to medical practitioners would be limited. Their pre-pandemic interview-based qualitative study builds on the following themes:

(1) Health Information Needs of First Nations Young mothers.

(2) Interpersonal Health Information Resources:
      (i) Asking the Doctor/Telehealth,
      (ii) Female Family, and Friends; and

(3) Online Accessibility and User Skills:
        (i) Health Information Online,
        (ii) Social Media, and
        (iii) Navigation and Computer Skills.

The latter theme closely aligns to the work of PIAAC on digital agency. Although participants used online and social media resources to access health information, they expressed a lack of confidence in their ability to comprehend accessed information. In Rheault et al.'s (2019) study, they found that all the young women had a smartphone, access to a computer, and the Internet, but they reported challenges with their navigational skills and expressed the desire to develop their ability to navigate through the Internet to access online health information/services.

In September 2021, Ilze Brands Kehris, the United Nations Assistant Secretary-General for Human Rights, said that Indigenous peoples had been disproportionately affected by COVID-19, as the pandemic had exposed and exacerbated pre-existing structural inequalities and systemic racism. She emphasized the importance of the participation of Indigenous peoples in United Nations fora, particularly on issues that affected them. Given the disproportionate impact that COVID-19 had had on Indigenous peoples, their participation was more critical than ever – particularly in regard to recovery efforts and to reverse the trend of growing inequalities.[68]

Allan et al (2022) undertook a comparison of rural Australian First Nations and Non-First Nations survey responses to COVID-19 risks and impacts as a study in public health communications. Their quantitative analysis using a sizeable population sample of people living in rural western New South Wales Australian First Nation and non-First nation communities.[69] They found significant differences in the responses of the Australian First Nation and non-First Nation respondents with the results reflect a significantly higher level of anxiety among the First Nations Australians in the sample: they felt afraid more often, felt it was highly likely they would catch the virus and if they did catch the virus perceived that it would be very harmful. Living with children under eighteen years of age and in small rural towns were key factors linked to feeling afraid of COVID-19 and First Nations status.

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[68] The United Nations, (2021) *Indigenous Peoples Have Been Disproportionately Affected by COVID-19 – Senior United Nations Official Tells Human Rights Council* Humans Rights Office of the High Commissioner, https://www.ohchr.org/en/press-releases/2021/09/Indigenous-peoples-have-been-disproportionately-affected-COVID-19-senior

[69] This is the first reference to Aboriginal communities in Australia as Australian First Nation.

Allan et al. (2022) conclude that health risk communication in pandemic response should include an equitable focus on rural areas, recognizing that First Nations Australians are a significant proportion of the rural population with different risk factors and concerns than those of non-First Nations Australians. The Australian Government should include rural areas in planning pandemic responses, recognizing that First Nations populations are a significant proportion of the rural population creating syndemic conditions.[70]

A small-scale interview-based study of Indigenous youth was completed in 2022 by Thomas et al, through a series of nine virtual interviews with Inuit youth in Nunavut on the impacts of COVID-19. Their study is one of the first to detail the impacts of the pandemic on remote communities. School and organized activity closures, including sports, had a profound effect on youth's wellbeing. Most schools transitioned to part-time classes. Sports and community activities were largely cancelled. An additional stressor at this time was increased rates of unemployment. Various youth expressed losing their jobs or having a family member become unemployed. The loss of jobs, activity cancellations, changes in school routines, and fewer social interactions were described as causing boredom and emotional turmoil, specifically sadness and fear.

> *We were really bored sometimes but it's just because [before COVID-19] we would always meet to play hockey every day . . . All the youth were bored without the activities that were open. Usually, we would have a lot of activities that would open . . . School got shut down for almost a year, too. That really sucked. Without all the sports and without school, it was pretty hard to keep up with the pandemic and all that. It's been kind of hard and a lot of youth here are sometimes . . . sometimes [it's] hard for the youth here. Some kids were like really sad. - Youth 1*

> *Before COVID, I got my mindset out of smoking and [now I am] just going down . . . back into the pit. When COVID hit, it took a toll on me and I went back into the drugs and [started] thinking a totally different mindset. - Youth 5*

They found that suicide was a theme spoken of outside the formal interview process, with two of the nine youths stating they had experienced a recent personal loss due to suicide. However, there is a strong theme of resilience that runs throughout their findings centered around traditional lifestyles, being on the land, starting Inuit sewing programs, working with children, and learning to skate. Thomas et al. (2022) explores the resiliency of Inuit

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[70] The syndemic conditions can include of low education, childhood maltreatment, depression, HIV, alcohol and cocaine use, and obesity have been established as independent risk factors for, for example cardiovascular risk.

Qaujimajatuqangit (IQ) which encompasses traditional knowledge and wisdom around childrearing, connecting with nature, thriving in a Northern climate, and building a harmonious family and community life.

The Inuit communities are also the focus of a Statistics Canada report on food security in Inuit Nunangut, which found that one of the strongest contributing factors to household food insecurity was education (Arriagada, 2017). Since obtaining a high school diploma is often considered the minimal educational requirement to access the labour market, workers who do not have a high school diploma have greater difficulty finding work let alone and are also more vulnerable to economic downturns. Education is thus closely related to household food insecurity as it affects employment and income opportunities. Although the educational attainment of the Inuit continues to increase, many still do not complete high school. According to the 2016 Census, 51.9% of Inuit aged 15 and above had not completed a high school diploma, compared to 17.6% of the non-Aboriginal population.[71] Among Inuit adults, only 3.9% had attained a university degree, compared to 23.9% of the non-Aboriginal population. Among Inuit aged 25 and over in Inuit Nunangat, the probability of experiencing food insecurity was 45% for those who had completed high school, compared to 55% for those who had not completed high school, even after controlling for other factors. A longitudinal analysis of the Aboriginal People Survey across four cycles, spanning nearly 20 years, shows a trend of decreasing participation in hunting, fishing or trapping among residents of Inuit Nunangut (Kumar et al, 2018). They also find that employed Inuit were more likely than the unemployed and out-of-the-labour-force Inuit to hunt, fish or trap. The message here is that it costs money to be on the land from snow machines, to rifles, to fuel and camping equipment to food, as well as time of work.

3.17   STEM, ICT and Indigenous learning

Major questions are emerging about Indigenous peoples in the new and emerging economies, where the priority is on scientific, technology, engineering, and math (STEM)

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[71] Statistics Canada, 2018. Aboriginal Population Profile. 2016 Census, Canada Catalogue no. 98-510-X2016001. Ottawa. Released July 18, 2018. http://www12.statcan.gc.ca/census-recensement/2016/dp-pd/abpopprof/index.cfm?Lang=E

Figure 33: First Nation Participation in STEM Sector Education and Labour Force Outcomes 2016 Census					
STEM and BHASE (non-STEM) groupings, Major field of study - Classification of Instructional Programs (CIP) 2016 (16)	**Total - Labour force status**	**As a % of all STEM**	**Participation rate**	**Employment rate**	**Unemployment rate**
Census Population	**Non-Aboriginal**				
Total - STEM and BHASE (non-STEM) groupings, Major field of study - Classification of Instructional Programs (CIP) 2016 [4] non-Aboriginal	27418100				
STEM	2813510		77.7	72.6	6.6
Science and science technology	823385	29.3%	74.5	69.5	6.7
Engineering and engineering technology	1354370	48.1%	77.3	72.1	6.8
Mathematics, computer & information science	635760	22.6%	82.5	77.4	6.2
Census Population	**First Nation**				
Total - STEM and BHASE (non-STEM) groupings, Major field of study - Classification of Instructional Programs (CIP) 2016 [4] First Nation	691405				
STEM	23640		77.6	67.4	13.2
Science and science technology	5680	24.0%	78.9	69.5	11.8
Engineering and engineering technology	12695	53.7%	76.6	65.5	14.5
Mathematics, computer & information science	5265	22.3%	78.6	69.3	11.7
Source: Statistics Canada - 2016 Census. Catalogue Number 98-400-X2016263 Coates and Finnegan 2022					

literacy, as well as Information and Communications Technology (ICT).[72] Elizabeth McKinley, a STEM professor of Indigenous education at the University of Melbourne, Australia (2016) states that "Indigenous students do not perceive STEM subjects as being welcoming. As STEM educators, we need to take a broader perspective that

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[72] 2021 Census population counts of Indigenous population will be released on September 21, 2022. If you like to have the results crossed by education or labour force status, results on related to education and labour force will be released on November 30, 2022.

encompasses the complex interaction of family, social, cultural, educational, economic and political contexts, and to consider the nature of knowledge and the importance of cultural identity to Indigenous communities."

The 2016 Census of Canada records that only 3.6% of the First Nation population (15+) had accomplished a degree in STEM field; this represents 23,640 out of almost 700,000 people. In contrast, 10.1% (2,813,510) of non-Aboriginal adults 15 years of age and older had completed. For First Nation students that did complete a STEM degree, their distribution across the three STEM categories is fairly similar to the non-Aboriginal population, at 24% versus 29.3% for sciences, 53.7% compared to 48.1% for engineering, and 22.3% compared to 22.6% for mathematics (Figure 33).

What is strikingly different is the labour market outcomes for First Nation STEM graduates versus the non-Aboriginal population with unemployment rates (UR) across all three STEM categories being twice that of the non-Aboriginal graduates. First Nation STEM graduates had an UR of 13.2% in 2016, compared to 6.6% for their non-aboriginal counterparts. Meanwhile, the average unemployment rate for Canada from the Statistics Canada Labour Force Survey was reported as 7% in X, dropping to 6.3% in 2017. Using either unemployment rate data from the Census or LFS, the First Nation UR rate for STEM graduates is abnormally high.

McKinley (2016) notes that "attempts to engage non-Western students into the subculture of STEM are challenging for STEM teachers. Students who are capable of negotiating the transitions between their everyday worlds and the subculture of STEM without having to assimilate or acculturate STEM's cultural baggage are seen as more successful learners, particularly by some Indigenous communities". She continues, "those who struggle to negotiate the cultural borders will require explicit instructional support to traverse from the subcultures of their peers and family into the subcultures of STEM and school STEM". The term "border-crossings" has been coined to describe this scenario and suggests that there are domains of knowledge specific to various cultural contexts, and that excursions from one way of knowing to another can occur in STEM learning.

An important area of research involves how teachers and students from diverse backgrounds make use of their linguistic and cultural experiences as intellectual resources in learning STEM subjects, and how they attempt to overcome the tensions and challenges that may arise when these resources are found to be discontinuous with the way STEM subjects are defined and taught in the classroom (McKinlay, 2016).

Jin (2021), in a detailed assessment, reviewed 24 programs focusing on STEM and Indigenous youth learning.[73] Jin notes that two features, cultural relevance and scientific inquiry, were evident across 23 of the 24 programs. In some cases, students learned and experienced Indigenous ways of knowing, including respect for the land, and reciprocal relationships with the environment and others. In other cases, student learning was embedded in the context of traditions and stories of Indigenous tribes, such as traditional festivals and cultural activities. There were also programs, that engaged students in investigation of issues faced by the local Indigenous communities (e.g., management of natural resources).

Figure 34: After Jin, 2021, Outcomes reported in the studies

Outcome Category	Sub-Category	Explanation
I: Science-related Outcomes	Conceptual learning in science	Development of scientific knowledge and understandings, and development of procedural knowledge and skills of scientific inquiry
	Nature of science (NOS)	Development of understandings of NOS
	Interest in and attitudes towards science or STEM	Development of interests in and positive attitudes towards science and other STEM subjects
	Postsecondary education and career options	Willingness to pursue a postsecondary education and/or a career in science or STEM areas
	Identity as science learners	Construction of identity as science learners through such as building confidence in learning science
II: Indigenous culture-related Outcomes	Understandings of traditional Indigenous knowledge	Development of understandings of Indigenous knowledge and their own traditional cultures
	Interest and pride in Indigenous knowledge and cultures	Interest in, pride of, and appreciation of their own traditional cultures
III: Outcomes related to the complementarity	Connection and complementarity between science and Indigenous knowledge	Awareness and appreciation of the connection and complementarity between the two knowledge systems: Western science knowledge and Indigenous knowledge

In summarizing the outcomes of the 24 programs, Jin (2021) found that three broad outcome categories were identified: (1) outcomes related to Western science or STEM; (2) outcomes related to Indigenous knowledge and culture; and (3) outcomes related to the complementarity between Western science and Indigenous science (See Figure 34 for detailed explanations.) Some programs focused mainly on science- or STEM-related outcomes, such as the development of scientific knowledge, increased interest in science and STEM, and enhanced identity of science learners. The integration of Indigenous knowledge (e.g., Indigenous stories, examples, and contexts) in these programs is mainly to make Western science more relevant to Indigenous students and to attract more

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[73] Jin (2021) recognizes the potential for research bias in her statement: "Overwhelmingly, programs reviewed in this study reported positive outcomes. These positive outcomes warrant some caution in interpretation. It is conjectured that there is a bias in terms of studies reporting positive results, suggesting that an overrepresentation may occur as researchers are hesitant to publish negative or null findings."

Indigenous students into STEM fields; this is what McKinley calls "bicultural science education." Jin (2021) critiques bicultural science as an attempt to increase the self-esteem of Indigenous students by placing value on their cultures, while maintaining the science programs' Western framework as a basis for instruction. As such, it fails to establish an Indigenous framework for instruction. Instead, she is a proponent of Aikenhead's "cross-cultural" approach, one which "gave students access to Western science and technology without requiring them to adopt the worldview endemic to Western science, and without requiring them to change their own cultural identity."[74] Programs which had outcomes falling in multiple categories (e.g., students developed their scientific knowledge as well as understandings of their own traditional cultures) are consistent with this approach.

Figure 35: First Nation Female Participation in STEM Sector Education and Labour Force Outcomes 2016 Census					
STEM and BHASE (non-STEM) groupings, Major field of study - Classification of Instructional Programs (CIP) 2016 (16) Female Non-Aboriginal	Total - Labour force status	As a % of all STEM	Participation rate	Employment rate	Unemployment rate
Female non-Aboriginal					
Total - STEM and BHASE (non-STEM) groupings,	14012620				
STEM	813780		75.5	69.9	7.3
Science and science technology	411140	50.5%	74.5	69.5	6.7
Engineering and engineering technology	201045	24.7%	77.5	70.7	8.7
Mathematics, computer & information science	201590	24.8%	75.4	70	7.1
Female First Nation					
Total - STEM and BHASE (non-STEM) groupings,	365330				
STEM	7395		74	65	12.1
Science and science technology	2975	40.2%	77.6	69.2	10.8
Engineering and engineering technology	2250	30.4%	71.3	59.8	16.2
Mathematics, computer & information science	2160	29.2%	71.8	65	9.7
Coates and Finnegan 2022, Statistics Canada - 2016 Census. Catalogue Number 98-400-X2016263.					

These programs have the potential to provide students with the foundation and encouragement for further study, and career options in science and STEM areas. For

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[74] Aikenhead, G. Integrating Western and Aboriginal sciences: Cross-cultural science teaching. Res. Sci. Educ. 2001, 31, 337–355

other students, these programs help identify two cultures: the culture of their Indigenous community, and the culture of Western science and STEM, and "help students feel at ease in both cultures and help students move back and forth between the two cultures." In this way, these programs contribute to both the diversity of STEM and Indigenous resurgence.

One program that was discussed in the interview process is the Verna J. Kirkness Education Foundation in Alberta which works with Indigenous youth across Canada to get them interested in STEM programs. The Kirkness program works with high school students to improve access to science, math, tech engineering, and partners them with a university professor for a week. Kirkness applies two students to one-professor ratio for a week, getting Indigenous youth interested in science.[75]

3.18   Local Indigenous Initiatives versus national programming

Report after report stresses the need to develop and support local and community-based initiatives with regards to Indigenous education, skills development, and labour market programming. The Government of Canada has made significant effort, particularly through the Indigenous Skills and Training Program, which supports over 100 Indigenous organizations in providing local training. Other initiatives involve the SPF Program, the First Nations LMI Survey and the Skills Investory Pilot. The effort is substantially and well-funded, but not always well-evaluated.[76] Radcliffe and Broughton (2019) provide an insightful discussion of the problem of top-down programming in the Australian context; however, the findings are relevant nonetheless:

> *A study of four diverse communities in New South Wales and Queensland found that community engagement efforts were often, impacted by a deficit view, focused on perceived weaknesses rather than strengths. This led school staff to interpret community engagement as a 'means to change, reframe and modify that out-of-school context... .[thereby reframing] 'engagement' as a task of fixing and repairing, rather than knowing, a cultural/racial Other'. Lowe (2011) argues that these partnerships are designed to give the appearance of empowering citizens, yet the neo-liberal theory and practice which frame such partnerships*

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[75] For information on this initiative, see the Vera Kirkness Foundation https://vernajkirkness.org/.
[76] Information is available at https://www.tbs-sct.canada.ca/ems-sgd/edb-bdd/index-eng.html#infographic/program/HRSD-BGO10/intro/.-.-(panel_key.-.-'profile). See also https://www.tbs-sct.canada.ca/ems-sgd/edb-bdd/index-eng.html#infographic/program/HRSD-BGO08/intro/.-.-(panel_key.-.-'profile)

> *prevent parents and communities from participating as equal partners with schools or teachers. He reminds us that schools do not exist in a vacuum.*

and

> *It appears that deficit views of communities and families are still far too commonly a barrier to effective community engagement. As we argue below, very low rates of adult literacy constitute another barrier and, in fact, these problems are intertwined. Meanwhile, the most recent review of education for Aboriginal students calls once again for improved involvement, decision making and ownership by Aboriginal communities, but with no mention of this barrier (Gillan, Mellor, & Krakouer, 2017).*

In 2018, the OECD, in *Improving local skills training for Indigenous People in Canada',* in *Indigenous Employment and Skills Strategies in Canada,* recommends getting local governance right: The success of any program or policy depends on having optimal governance frameworks and coordination at the national and local level, which provides incentives for policy innovation. The OECD considers how best to design national policies in a manner which rewards local innovation in Indigenous employment and economic development. The stress here is on local Indigenous innovation; they also believe that Canada needs to improve investment in Indigenous community enterprises to bolster local Indigenous employment. They highlight successful Indigenous projects including:

- Centre for Aboriginal Human Resource Development (CAHRD), based in Winnipeg, Manitoba, provides employment, adult and post-secondary education, trades training, day care facilities, and student transitional housing services to prepare Indigenous People to be self-reliant and adaptable to the labour market and employment, serving all Indigenous People in Winnipeg, Manitoba.
- Community Futures Treaty 7 (CFT7), based in the province of Alberta, supports all First Nation individuals to obtain and maintain meaningful employment based on community needs through the provision of training in the Treaty Seven catchment area.
- MAWIW Council in Elsipogtog First Nation, New Brunswick supports and promotes the empowerment of First Nation's People residing within the organization's service area, providing the appropriate training to HR staff to ensure proper delivery of services to achieve self-sufficiency and independence through counseling, training, and employment, providing resources to its communities; and
- Kiikenomaga Kikenjigewen Employment and Training Services (KKETS), in Thunder Bay, Ontario, assists Indigenous People prepare for, acquire and maintain successful employment by providing demand-driven education, training and employment opportunities through partnerships with community, education institutions, business/industry and government.

Boughton et al. (2022) in *Measuring adult English literacy improvements in First Nations communities in Australia*, found that 73% of participants in First Nation community-controlled literacy training programs in six communities improved their literacy scores, moving up at least one full level on one or more of the Australian Core Skills Framework indicators. The stress again being on community-control. Prior to this paper, Ratcliffe and Broughton (2019) had explored the continuing alienation of Aboriginal communities in Australia from educational decision making. They contend that addressing the problem of low adult literacy is necessary to improve relationships between communities and schools in widespread and sustainable ways. In their words:

> *Communities who have participated in the Yes, I Can! Aboriginal Adult Literacy Campaign help us to understand a number of important issues, including, the extent of disenfranchisement that is associated with inadequate adult literacy, the enormity of the challenges faced by previously low-literate and disengaged people to re-engage in community life, the additional pressures placed on literate members of the community when many people have minimal literacy, and the relationship between low rates of adult literacy and the persistence of deficit thinking on the part of schools (Radcliffe and Broughton, 2019).*

Meanwhile, Ball (2021) takes the issue of Indigenous participation in early literacy education a step further by questioning the entire concept of standardized testing of Indigenous children. Ball (2021) notes that the construct "early childhood" runs counter to some "Indigenous ways of knowing and being. Indigenous community leaders and knowledge keepers reject the idea that all children should develop according to a homogenizing universal standard that is not grounded in specific culturally based goals and practices surrounding children's development and does not respect each child's unique character." Ball concludes that collaborating with Indigenous children, families, and communities to co-create culturally relevant assessment is the way forward.

Shalley and Stewart, (2017) in a comprehensive statistical analysis of the gaps between Australian Aboriginal people and the Newcomer Society using multiple indicators of literacy, numeracy and problem-solving, present recommendations to the Australian government. One of their key recommendations is to develop an evidence-based, Indigenous-led, Aboriginal adult English learning policy for the Northern Territory informed by a broadly composed consultative group with significant involvement from sectors including language literacy and numeracy (LLN) specialists, education and training, legal, health, employment, business, voluntary, community services and media. Colbourne et al. (2019) critique the research approach of *Indigenous Works* (https://indigenousworks.ca/en) and their program's "two eyed seeing: mapping the case for Indigenous-led research." This paper is grounded in an Indigenous research paradigm that is facilitated by Indigenous-led community-based participatory action research (PAR) methodology informed by the Two Row Wampum and Two-Eyed Seeing

framework to bridge Indigenous science and knowledge systems with western ones. The findings point to the need for greater focus on how Indigenous and western knowledge may be aligned within the methodological content domain while tackling a wide array of Indigenous research goals that involve non-Indigenous allies. This paper addresses the need to develop insights and understandings into how to develop a safe, ethical space for Indigenous-led trans-disciplinary and multi-community collaborative research partnerships that contribute to community self-governance and well-being. Using the *Indigenous Works* research formula, research on Indigenous literacy would be designed by the Indigenous community for the Indigenous community stressing their understanding of the educational proficiency gap and what that means to them in their worldview.

3.19   National Metrics, how appropriate are they to Indigenous communities?

In 2020, the CCAB stated that the country needs further clarity on what labour-market data is most useful to Indigenous business operators, policymakers, and workers. This parallels the Organization for Economic Co-operation and Development (OECD) 2018 statement that Indigenous communities in Canada lack enough Indigenous labour-market data to plan programs and services. This questions the entire logic of the data being collected saying "the data neither reflects Indigenous realities nor provide the requisite data resources for Indigenous communities and First Nations to fully participate in determining our own futures." Walters believes that these labour market, business educational data reflect *the state-preferred mode for the administrative ordering of an Indigenous sub-population.* Walter says: "It defines who and what Indigenous Peoples are, and who and what we are not; it delineates what can be seen and, perhaps more critically, what the state refuses to see". Finnegan and Coates (2016) in an analysis of the applicability of the Arctic Social Indicators as a model for interpreting community well-being in the provincial north of Saskatchewan note:

> *Northern communities face enormous pressures to adapt to changing political, economic, climatic, and social circumstances. They do so with profound disadvantages that range from limited local professional capacity to small populations and economic marginalization. Most often, they also suffer from the basic information needed to make informed decisions. The smallest communities in the country, particularly Aboriginal settlements, have little information at their disposal to plan properly for the future.*

Walter et al.'s (2020) work is highly critical of "State Big-data" that use transformative and often radical simplifications of social environments, so that "exceptionally complex, illegible and local social practices" are standardized to allow central recording and monitoring. The resulting data do not represent the reality of the society that is being

depicted, only the slice that is of interest to the state (Andersen, 2014).[77] Making these data available to outside researchers and/or data linkage processes will magnify, not reduce, the deficit trope.

Walter concludes that the marginalized position of Indigenous people within the Australian nation state means that they are far more likely to face the dangers inherent in Open Data, and less likely to have the resources or the position at the decision-making policy table to reap any benefits. Coates and Finnegan (2016) would add that they may also distrust the state data and furthermore may not see the type of data generated by the state as being relevant to them. This power imbalance causes Indigenous Peoples to continue to be easily erased from the systems that determine data access, use and interpretation.

Walter, working with a wider group of Indigenous data sovereigntists, constructed a conceptual model of what Indigenous relevant data sovereignty should look like. For instance, Blaming, Aggressive, Decontextualized, Deficit, and Restricted (BADDR) readily defines the way we look at Indigenous data in the newcomer economies. In an early study, Walters explains Newcomer Society statistics as being all about the 5-Ds: disparities, deprivation, disadvantage, dysfunction and difference.[78] Hamel and Laniel (2014), in *Producing official statistics via voluntary surveys,* describe the measures Canada takes for accurate data collection, data processing and estimation and the quality assurance processes underlying the release strategy they use in their products, such as the less than comprehensive National Household Survey of 2011. Effectively, Walters and other Indigenous data sovereigntists want to change the narrative, with the current message being colonial in nature presenting the Indigenous population in comparison to the Newcomer Society as the norm that the Indigenous population should be aspiring to.

In Indigenous Statistics (2013), Andersen and Walters quote Daniel Salée (2006) who writes that "policy makers appear to possess a fairly good sense of what ails Aboriginal communities and individuals: the higher incidence of family violence, youth suicide, psychological distress and substance abuse, poorer individual health, weak or undeveloped capacity for economic development, the greater likelihood of exclusion from key labour markets, substandard housing and sanitary conditions – all of which makes life for them, at least on the surface, more difficult and less appealing. It would be

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[77] See: Andersen, C. (2014) *Metis: Race, recognition, and the struggle for Indigenous peoplehood*, Vancouver, UBC Press.
[78] See: Chris Andersen, Maggie Walter (2016) Indigenous Statistics: A Quantitative Research Methodology, Taylor and Francis.

surprising if existing census classifications produced data on anything but these kinds of conditions." Walters and Andersen (2013) conclude: "Not because they are not legitimately afflicting our communities but, rather, because current statistical configurations are only geared to produce empirical pictures of such conditions."[79]

Figure 36: BADDR data versus Indigenous and Torres Strait Islander data needs

Dominant BADDR data	Indigenous data needs
Blaming Data	**Lifeworld Data**
Too much data contrasts Indigenous/non-Indigenous data, rating the problematic Indigene against the normed Australian as the ubiquitous pejorative standard	We need data to inform a comprehensive, nuanced narrative of who we are as peoples, of our culture, our communities, of our resilience, our goals and our successes
Aggregate Data	**Disaggregated Data**
Too much data are aggregated at the national and/or state level, implying Indigenous cultural and geographical homogeneity	We need data that recognise our cultural and geographical diversity and can provide evidence for community-level planning and service delivery
Decontextualised Data	**Contextualised Data**
Too much data are simplistic and decontextualised, focussing on individuals and families outside of their social/cultural context	We need data that are inclusive of the wider social structural context/complexities in which Indigenous disadvantage occurs
Deficit, Government Priority Data	**Indigenous Priority Data**
Too much (way too much) 5D data: These data focus on disadvantage, disparity, dysfunction, difference, deficit (Walter 2016) collected to serve government priorities	We need data that measure not just our problems but data that address our priorities and agendas
Restricted Access Data	**Available Amenable Data**
Too much data are barricaded away by official statistical agencies and institutions	We need data that are accessible and amenable to our requirements

The PIAAC data and indeed almost all data presented in our western research stresses the gap between Indigenous and non-Indigenous with the prominent narrative being that the government needs to create programs to pull in the Indigenous population up to our level. Walter et al. (2020) questions the logic of this approach and calls for a retooling of Indigenous data gathering and statistics but how do we get here and how will this

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[79] Maggie Walter and Chris Andersen (2013) Indigenous Statistics: A Quantitative Research Methodology Taylor & Francis Group

approach provide a more applicable set of metrics for Indigenous self-governing bodies? This is an exercise in self-government and community dialogue which is worth exploring if it empowers Indigenous organizations and governments to develop metrics that they can trust, and that better serves their needs in order to better inform their policies. The stress here is on - "Their."

> *Indigenous data can be a cultural and economic asset, providing invaluable information for Indigenous groups to set their own goals, make their own strategic decisions and measure their progress. However, inadequate data, the wrong data or the wrong approach to data are not only a waste of resources but can have negative fiscal and human well-being impacts on Indigenous Peoples.*
>
> Walter (2020)

Conclusion: Indigenous skills development, training and employment have been national priorities for several decades, although much of the problem remains. Money is not the largest barrier, nor is political or administrative commitment. The challenges are complex and multi-factual, representing the long and disruptive history of colonial interventions, land dispossession, welfare dependency, and a very convoluted relationship with government-provided education. There have been extensive studies of skills and training initiatives aimed at Indigenous peoples and communities, and many critiques of specific programs and even the underlying motivations of governments and corporate partners. The review of the literature supports a series of general observations:

- As with all aspects of Indigenous affairs in Canada, there are widespread differences (First Nations, Metis, Inuit, rural, remote, urban, male, female, youth and adult) within the broad field of Indigenous training and skills development. Effective solutions will emerge at the region and, often, the local level and not according to a set of national initiatives.
- Deep socio-cultural problems, including systemic racism directed at Indigenous peoples in the education system and in employment settings, undermine many of the efforts.
- Education shortcomings, rooted in a long and painful histories of Indigenous residential and day schools, continue to affect training and skills acquisition efforts.
- Indigenous peoples in rural and remote communities faced more complicated challenges, including the comparative absence of stable, high-wage employment opportunities.
- The rapid growth in the number of Indigenous post-secondary students and graduates and the comparatively high employment rates and wages of these graduates stands as a marked success.

- Proper and systematic evaluation of Indigenous skills and training programs makes it difficult to determine the actual effectiveness and impact of government-funded programs.
- There are significant indications that Indigenous run and controlled training programs are more effective than programs offered by other governments and non-Indigenous institutions.
- There is growing evidence that transformative innovations in program design, calling primarily on Indigenous knowledge, land-based experienced and community-based programming.
- As is the case with all skills and training programs, direct connections to the workforce aids the participants' transition to work. For Indigenous peoples, these connections are strongest in the resource sector.

The research to date on Indigenous skills development, training and employment has explored the complexities and complications of the field and made it clear that a comprehensive and systematic solution to a widely acknowledged socio-economic problem. Efforts by governments, Indigenous communities and a wide variety of Indigenous and other non-governmental organizations will continue.   More research is needed on certain areas, including internal to government decision making processes and allocations, the characteristics of "successful" training institutes, patterns of learning within the sector, longitudinal studies of program participants to determine the long-term effectiveness of the initiatives, and expanded analysis of the degree to which non-Indigenous cultures and values drive the programs and the manner in which Indigenous knowledge and norms are incorporated into the training.

4. Bibliography with Abstracts Indigenous People in Canada - the Skills Gap

4.1 Search Terms and Research Paths

The research team has utilized search engines at the University of Saskatchewan and the University of Limerick to build the bibliography looking to access recent academic, government, and research agency think-tank literature to conduct a literature review and environmental scan on the knowledge gaps about the foundational and transferable skills of Indigenous Peoples in Canada, as well as the employment and labour market challenges they face.

Key NAME terms included:

Canada, OECD, Australia, New Zealand First Nation, Indigenous, Métis and Inuit, Māori, and Aboriginal, a term in decline in Canadian research, though it provides access pertinent Australian literature.

These where cross-referenced and searched against:

1) Education, skills, learning, trades, professionals, high school graduation, childcare, early childhood education,
2) PIAAC, literacy, competency, numeracy, digital literacy,
3) Employment/unemployment, wages, salaries, income, earning, labour force, market(s)
4) Mining, natural resources, forestry, skills, and training programs, technology change,
5) Related to data sources: PIAAC, Aboriginal People's Survey, Census of Canada, Labour Force Survey, Employment Insurance, Self-employment, Health Surveys & Health Literacy, Ministers of Education surveys and First Nations/Indigenous People.

As per our proposal to the Office we have keyed in on recent academic literature and research reports since 2018.

Alcover, C.-M., Guglielmi, D., Depolo, M., Mazzetti, G. (2021) '"Aging-and-Tech Job Vulnerability": A proposed framework on the dual impact of aging and AI, robotics, and automation among older workers', Organizational psychology review, 11(2), 175–201.

As the aging population and workforce constitute a worldwide concern, it is becoming necessary to predict how the dual threat of aging and technology at work increases the job vulnerability of older workers and jeopardizes their employability and permanence in the labor market. The objective of this paper is twofold: (1) to analyze perceptions of artificial intelligence, robotics, and automation in work settings and the expected impact of these technologies on older workers to contextualize this emergent phenomenon; and (2) to propose a general model related to "Aging and-Tech Job Vulnerability" to explain and predict the combined effect of aging and AI/robotics/ automation on job insecurity and additional outcomes among older workers. The propositions of the Age-and-Tech Job Vulnerability model developed in this paper seek to present a first approach for the conceptual advance and research on this emerging phenomenon and entails several theoretical and practical implications for organizational psychology.

Alejandro, A.J., Fong, C.J., De La Rosa, Y.M. (2020) 'Indigenous Graduate and Professional Students Decolonizing, Reconciling, and Indigenizing Belongingness in Higher Education', *Journal of college student development*, 61(6), 679–696.

Abstract: Although sense of belonging has been conceptualized by higher education institutions in marginalizing ways, we reclaim the construct as authentic relationships characterized by humanization, mutuality, and respect for students' cultural assets, values, and social identities. To dismantle colonizing perspectives and foreground Indigenous ways of knowing and being, our study reflects the narratives of three CIS male, Indigenous graduate and professional students and their educational experiences in the US. In a collective case study with an autoethnographic lens, our findings highlight decolonizing aspects of belonging, embracing Indigenous values of the Peoplehood matrix, emphasizing relationality in community, and bridging Indigenous knowledge with academe.

Alessandro Alasia, Frédéric Bédard, Julie Bélanger, Eric Guimond and Christopher Penney (2017) *Measuring remoteness and accessibility - A set of indices for Canadian communities*, Ottawa Statistics Canada, Catalogue no. 18-001-X

Proximity to centres of economic activity and population agglomerations is an important determinant of regional socioeconomic outcomes and, consequently, a relevant factor in the analysis and delivery of policies and programs. For this reason, measures of remoteness and accessibility have been used by various departments for years. Some of the existing indices were developed in the 1980s and have been used since with only minor revisions. This study was undertaken in response to the need to update and

upgrade the current measures of remoteness. The objective was to conceptualize and implement a method that takes into account the most recent literature on the subject, as well as taking advantage of new computational opportunities provided by the integration of official statistics with data from non-official statistical sources.

Allan, J., Kleinschafer, J., Saksena, T., Rahman, A., Lawrence, J., Lock, M. (2022) 'A comparison of rural Australian First Nations and Non-First Nations survey responses to COVID-19 risks and impacts: implications for health communications', BMC public health, 22(1), 1276–1276.

Introduction: This study investigated differences between rural Australian First Nations and non-First Nations survey respondents' perceptions of COVID-19-related risks and analysed other variables that could predict an exacerbation of anxiety related to COVID-19 harms. Methods: A cross-sectional online and paper survey of rural residents from the western regions of NSW, Australia, was conducted. Descriptive and multivariate statistical analyses were used to assess links between First Nations status and demographic measures including postcode, age, gender, education, rural or town/village location, proximity to medical services and living situation. The analysis included five items related to perceptions about COVID-19: perceived likelihood of contracting COVID-19 in the next 12 months, perceived harmfulness of the virus, how often people felt afraid, perception about respondents' ability to do something about the virus and perceived economic impacts of the pandemic. Results: There were significant differences between First Nations (n=60) and non-First Nations (n= 639) respondents across all sociodemographic categories. The results reflect a significantly higher level of anxiety among the First Nations Australians in the sample: they felt afraid more often, felt it was highly likely they would catch the virus and if they did catch the virus perceived that it would be very harmful. Living with children under eighteen years of age and in small rural towns were key factors linked to feeling afraid of COVID-19 and First Nations status. Conclusion: Health risk communication in pandemic response should include an equitable focus on rural areas, recognising that First Nations Australians are a significant proportion of the rural population with different risk factors and concerns than those of non-First Nations Australians. This principle of First Nations-led design is critical to all health policy and planning. The Australian Government should include rural areas in planning pandemic responses, recognising that First Nations populations are a significant proportion of the rural population creating syndemic conditions.

Anderson, Thomas (2019) Employment of First Nations men and women living Off-Reserve. Statistics Canada, 2019 Aboriginal People's Survey, Catalogue no. 89-653-X2019004.

This paper uses the 2017 Aboriginal Peoples Survey to assess the employment characteristics of First Nations men and women. The 2017 APS represents the fifth

cycle of the survey and focuses on participation in the economy, including factors effecting economic participation, labour mobility, entrepreneurship, post-secondary education, targeted skills training, sources of income and financial well-being.

Anon (2018) 'Improving local skills training for Indigenous People in Canada', in *Indigenous Employment and Skills Strategies in Canada*. [Online]. Paris: OECD Publishing. pp. 47–62.

This report looks at a range of key labour market, economic and social indicators related to Canada's growing Indigenous population, which comprises First Nations, Inuit, and Métis. In 2016, there were over 1.6 million Indigenous People in Canada, accounting for 4.9% of the total population, which is a significant increase from 3.8% in 2006. The report looks at the implementation of the federal government's Indigenous Skills and Employment Training Strategy through in-depth analysis across four case study areas, including 1) the Centre for Aboriginal Human Resources and Development in Winnipeg, Manitoba; 2) Community Futures Treaty Seven in Calgary, Alberta; 3) MAWIW Council in Fredericton, New Brunswick; and 4) Kiikenomaga Kikenjigewen Employment and Training Services (KKETS) in Thunder Bay, Ontario. The report highlights critical success factors to better link Indigenous People to high quality jobs while also providing recommendations regarding future labour market and skills programming for Indigenous People in Canada.

Anon (2018) *OECD Reviews on Local Job Creation Indigenous Employment and Skills Strategies in Canada*. OECD.

Across the OECD, many countries are focusing on vocational education and training (VET) to build occupational-specific skills and better link people to quality jobs. VET is proven to facilitate better school-to-work transitions. In 2017, the employment rate of the working-age population with vocational education in Australia was 81%, well above the overall average employment rate of 61%. The participation of Indigenous Australians in VET remains high. In 2018, 142 800 Indigenous Australians participated in VET, which was an increase of 38.6% from 2005 when there were 73 410 government-funded Indigenous programme enrolments.

Arriagada, P. (2021) The achievements, experiences and labour market outcomes of First Nations, Métis, and Inuit women with bachelor's degrees or higher. Ottawa: Statistics Canada Catalogue no. 75-006-X.

This new study in *Insights on Canadian Society* examines and provides new information about the educational attainment and labour market outcomes of First Nations, Métis, and Inuit women with a bachelor's degree or higher, primarily between the ages

of 25 to 64, using data from the 2006 and 2016 Censuses of Population, the 2017 Aboriginal Peoples Survey and the 2018 National Graduates Survey.

Arriagada, P., & Bleakney, A. (2019). *Inuit participation in the wage and land-based economies in Inuit Nunangat*. Ottawa: Statistics Canada, Catalogue no. 89-653-X2019003.

In 2016, there were 65,025 Inuit in Canada, and close to three-quarters (73%) lived in Inuit Nunangat. According to the Census, the Inuit population increased 29% from 2006 to 2016. Inside Inuit Nunangat, the Inuit population grew by 20% compared with outside of Inuit Nunangat where the Inuit population grew by 62%. The rapid growth of the Inuit population is expected to continue. According to all scenarios from the most recent Aboriginal population projections, the Inuit population overall could reach between 86,000 and 95,000 people by 2036, while Inuit living in Inuit Nunangat could reach between 64,000 and 72,000 (Morency et al., 2015).

Arriagada, P. (2017) Food insecurity among Inuit living in Inuit Nunangat, Ottawa Statistics Canada Catalogue no. 75-006-X.

Using data from the 2012 Aboriginal Peoples Survey (APS), this study examines the prevalence of food insecurity among Inuit aged 25 and over living in Inuit Nunangat, and the factors associated with food insecurity among Inuit adults. Food insecurity can refer to situations when the amount of food purchased does not last and there is not enough money to buy more food, balanced meals are unaffordable, or household members cut the size of their meals or skip meals because there is not enough money for sufficient food. This study also discusses some of the health outcomes of Inuit adults who live in a food insecure household.

Arriagada, P., & Hango, D. (2016). Literacy and Numeracy among Off-Reserve First Nations People and Métis: Do Higher Skill Levels Improve Labour Market Outcomes? Insights on Canadian Society. *Statistics Canada*.

This article examines the literacy and numeracy skills of Off-Reserve First Nations and Métis adults, focusing on the factors and labour market outcomes associated with higher skill levels. In this study, individuals in the higher range for literacy and numeracy are defined as those who scored level 3 or higher (out of 5 levels) in tests administered by the 2012 Programme for the International Assessment of Adult Competencies (PIAAC).

Aulandez, K.M.W., Walls, M.L., Weiss, N.M., Sittner, K.J., Gillson, S.L., Tennessen, E.N., Maudrie, T.L., Leppi, A.M., Rothwell, E.J., Bolton-Steiner, A.R., and Gonzalez, M.B. (2021) 'Cultural Sources of Strength and Resilience: A Case Study of Holistic

Wellness Boxes for COVID-19 Response in Indigenous Communities', Frontiers in sociology, 6, 612637–612637.

The traditions, strengths, and resilience of communities have carried Indigenous peoples for generations. However, collective traumatic memories of past infectious diseases and the current impact of the coronavirus disease 2019 (COVID-19) pandemic in many Indigenous communities point to the need for Indigenous strengths-based public health resources. Further, recent data suggest that COVID-19 is escalating mental health and psychosocial health inequities for Indigenous communities.

Bal, A, Betters-Bubon J, Fish RE. A Multilevel Analysis of Statewide Disproportionality in Exclusionary Discipline and the Identification of Emotional Disturbance. Education and Urban Society. 2019;51(2):247-268.

Racial minority youth are disproportionally removed from their learning environment due to school discipline and placed in special education for emotional disturbance. These disparities continue to trouble families, educators, and policy makers, particularly within urban schools. Yet there is a paucity of research on how behavioral outcome disparities occur in different states. This study addresses this gap examining the extent and predictors of behavioral outcome disparities in Wisconsin. Using the entire state's data, we conducted multilevel logistic regression analyses. The analyses showed that African American students were seven times and Native American and Latino students were two times more likely to receive exclusionary discipline. African American students and Native American students were two to three times more likely to be labeled as emotionally disturbed. Students' race, gender, income, language, attendance, and academic proficiency were related to outcome disparities while school characteristics were not substantively meaningful predictors, excepting the percentage of transferred students. Implications for future research and practice are discussed.

Ball, J. (2021, July). Finding Fitting Solutions to Assessment of Indigenous Young Children's Learning and Development: Do It in a Good Way. In *Frontiers in Education* (Vol. 6, p. 257). Frontiers.

Standardized, norm-referenced assessments of young children's learning and development pose a number of challenges when used with Indigenous children, beginning with the very notion of the construct "early childhood" that runs counter to some Indigenous ways of knowing and being. Indigenous community leaders and knowledge keepers reject the idea that all children should develop according to a homogenizing universal standard that is not grounded in specific culturally based goals and practices surrounding children's development and does not respect each child's unique character. Three key problems arise with creating appropriate assessment of Indigenous young children's learning and development: 1) assessment in early

childhood programs is often done from the perspective of whether children are on track to be ready for school; 2) school systems, early childhood programs, and practitioners face a barrage of pressure to measure children's "progress" against universalist norms derived from Euro-Western ways of knowing and goals for children's development; and 3) knowledge of diverse Indigenous young children's varied lived experiences in today's urban and rural communities is extremely limited. This paper discusses these obstacles and draws from the author's many years of collaborating with Indigenous children, families, and communities to co-create culturally relevant assessment in a good way.

Banister, E. M., & Begoray, D. L. (2013). Reports from the Field: Using Indigenous Research Practices to Transform Indigenous Literacy Education: A Canadian Study. *Journal of American Indian Education*, 65-80.

Indigenous students face immense educational disadvantage in mainstream schooling which leads to a number of negative consequences for them as individuals and for their communities. Therefore, the issue of teaching literacy with principles derived from research informed by Indigenous ways of knowing is of critical importance. This article reviews adolescent literacy learning in general and the challenges faced especially by Indigenous students in Western classrooms. Next, we discuss the importance of cultural sensitivity in literacy teaching and describe a literacy education program based on principles for teaching literacy to Indigenous students using Indigenous research practices. We found that Indigenous students need teachers who establish relationships with them; classroom activities that encourage active involvement, inclusion of their cultural background, power sharing in the classroom, and use of a variety of sign systems - especially oral and visual ones - in order to improve their literacy.

Barber, M., & Jones, M. E. (2021). Inequalities in test scores between Indigenous and non-Indigenous youth in Canada. *Economics of Education Review*, *83*, 102-139.

This paper documents a robust achievement gap between the math scores of Indigenous and white youth in Canada between 1996 and 2008. Using data from the restricted-access National Longitudinal Survey of Children and Youth we show that after controlling for a rich set of observables, students who self-identify as Indigenous perform 0.31 standard deviations lower on a standardized math test compared to their white counterparts. We find that this test gap emerges by the age of 12, and it did not decline between 1996 and 2008, despite the recommendations of the 1996 Royal Commission on Aboriginal Peoples to ameliorate the public education system for Indigenous students. Counterfactual estimates from the decomposition method of Lemieux (2002) suggest that the test gap among the lowest performing students would have been eliminated if Indigenous students faced the same level of and returns to observable characteristics as white students. This exercise does not result in a

narrowing of the test gap in the upper tail, suggesting that unobservables, rather than observables, are driving the majority of the test gap among high achieving students.

Barker, Adam J. "Locating Settler Colonialism." *Journal of Colonialism and Colonial History*, vol. 13 no. 3, 2012. *Project MUSE*, doi:10.1353/cch.2012.0035.
No Abstract, Article Review

There has been a definite shift in recent years relating to studies of colonialism. Increasingly, scholars are asking what might seem like a regressive question—"what is colonialism?"—and encountering surprising answers. This shift has been sparked by a concept that, while part of the lexicon of "colonialism" for decades, was reinvigorated in the 1990s,[1] and is now perceived as key to a critical and challenging new perspective on colonisation. That concept is "settler colonialism": a distinct method of colonising involving the creation and consumption of a whole array of spaces by settler collectives that claim and transform places through the exercise of their sovereign capacity.

Bartel, Joan (2018)"Four Soft Skills for Employability and Ideas for Lessons,"
TESL Canada Journal/Revue TESL Du Canada, 83Volume 35, Issue 1, 2018

Research note no abstract.

Bell, L.A. (2017) 'Soft skills, hard rocks: Making diamonds ethical in Canada's Northwest Territories', Focaal, 2017(79), 74–88.

In 2007, Canada was the third-largest producer of diamonds in the world. Marketed as ethical alternatives to "blood diamonds," Canadian gemstones are said to go beyond basic "conflict-free" designations by providing northern Indigenous peoples with high-wage work and training. The article makes two connected points. First, it describes how the ethics of diamond mining are connected to the uneasy management of people groomed to do extractive work. Second, following the development and delivery of job training programs for Indigenous people over the course of the financial crisis of 2008–2009, this article reveals how mandatory "soft skills" courses attempt to adjust would-be worker speech to meet corporate norms in ways that were essential in maintaining the ethical sign value of subarctic stones.

Berge, S.T. (2020) 'Pedagogical Pathways for Indigenous Business Education: Learning from Current Indigenous Business Practices', International indigenous policy journal, 11(1), 1–20.

Business is one of the fastest growing areas in post-secondary education, but there is little understanding of Indigenous business practices. This article looks at three Arctic communities in the Yukon, the Northwest Territories, and Nunavut, and their associated

co-operative businesses. I examine how these businesses express cultural values, as well as the business skill needs within these communities. Key informant interviews were conducted in each of the three Arctic communities, and three conclusions were made: (a) Co-operatives act as links between communities and their economic activities, (b) Business skills within communities need to be developed, and (c) Business skills need to include cultural components, as co-ops represent cultural economic expressions.

Billington, M.G., Foldnes, N. Exploring the association between occupational complexity and numeracy. *Large-scale Assess Educ* 9**,** 19 (2021).

The basic cognitive skill of numeracy is a recognized form of human capital, associated with economic and social well-being for individuals and for nations. In this study, we explore how occupational complexity relates to proficiency in numeracy, among adults in full-time employment. We operationalize occupational complexity by constructing three measures of task complexity: complexity with data, complexity with people and complexity with things. Data from the international OECD survey of adult skills, 2012, is employed to investigate both the distribution of these three dimensions of occupational task complexity and how these relate to numeracy in 13 countries. The analysis indicates that data occupational complexity predicts numeracy scores, when controlling for age, gender, and educational level. The findings open for a hypothesis that occupational activities may enhance basic skills in adult populations. If elaborated and supported through further studies this finding has practical implications for workplace organization and contributes to theoretical understandings of the development of basic skills in adults.

Bischof, S. (2021) 'Mismatched, but Not Aware of It? How Subjective and Objective Skill Mismatch Affects Employee Job Satisfaction,' Social sciences (Basel), 10(10), 389.

Several studies suggest that skill mismatch reduces job satisfaction. To date, research has primarily investigated the impact of subjective skill mismatch; the impact of objective skill mismatch has less commonly been analysed and has generally only focused on mismatches in single skills. The present study addresses the question of whether both subjective and objective skill mismatch reduces employee job satisfaction. This article contributes to previous research by disentangling the effects of objective and subjective skill mismatch on job satisfaction based on a multidimensional measure of objective skill mismatch among employees in Germany. Based on the 2018 wave of the German National Educational Panel Study (NEPS) Adult Cohort, multiple linear regression models are herein estimated in order to investigate how subjective and objective skill mismatches affect people's job satisfaction. The findings indicate that subjectively skill mismatched employees are less satisfied with their job than matched employees to a statistically significant degree, even when controlling for the objective

mismatch. However, objectively skill mismatched employees do not show statistically significant lower job satisfaction compared to matched employees. Although there is considerable dissonance between objective mismatches and the subjective perception of being mismatched, the findings suggest that skill mismatch only reduces job satisfaction when employees perceive themselves to be mismatched.

Bleakney, Amanda and Alexandria Melvin (2022) Indigenous women and girls: Socioeconomic conditions in remote communities compared with more accessible areas, *Insights on Canadian Society*, Statistics Canada, Catalogue no. 75-006-X ISSN 2291-0840

This study uses the remoteness index classification and data from the 2016 Census of Population. Specifically, it examines the characteristics of First Nations, Métis and Inuit women and girls living in communities with varying levels of remoteness. Indigenous people in remote communities often benefit from a closer connection to their communities, cultures, traditions, languages, lands and resources. However, they also face unique barriers and challenges. For example, accessing goods and services may be more difficult for those living in remote communities that are farther from large population centres.

Bleakney, A., Masoud, H., & Robertson, H. (2020). *Labour market impacts of COVID-19 on Indigenous people: March to August 2020*. Statistics Canada= Statistique Canada. Catalogue no. 45280001.
This article uses monthly data from the Labour Force Survey (LFS) to examine labour market impacts of the COVID-19 pandemic on Indigenous people, in the eighteen-month period following the start of the pandemic. The analysis complements an earlier study which reported on labour market impacts in the first six months of the pandemic (Bleakney, Masoud and Robertson, 2020). Trends in employment, unemployment and labour force participation are examined for Indigenous and non-Indigenous populations, for First Nations people living Off-Reserve and Métis, as well as by sex, age group, region, and occupation group.

Blue, L. E. & Pinto, L. E. (2017) Other ways of being: challenging dominant financial literacy discourses in Aboriginal Context. *Australian educational researcher*. [Online] 44 (1), 55–70.

Financial literacy education (FLE) continues to gain momentum on a global scale. FLE is often described as essential learning for all citizens, despite the bulk of initiatives outside the compulsory school classrooms focused on educating economically disadvantaged individuals. Informed by Indigenous ways of knowing, being and doing a critical discourse analysis of FLE facilitators resources used in train-the-trainer workshops in/for a Canadian Aboriginal community was conducted to identify dominant

discourses. An uncomfortable space was uncovered as the ubiquitous focus on individual wealth accumulation contradicted Indigenous ways of knowing, being and doing, underscoring the challenges of embedding Indigenous epistemologies in highly institutionalised charitable organisations' attempts to help Indigenous (and non-Indigenous) peoples in poverty. Although this research is based on a Canadian program, the explosion of FLE as a "solution" to collective problems such as poverty lends itself to other—including Australian—contexts.

Boeren, E., Íñiguez-Berrozpe, T. (2022) 'Unpacking PIAAC's cognitive skills measurements through engagement with Bloom's taxonomy', Studies in educational evaluation, 73.

The Programme for International Assessment of Adult Skills (PIAAC) surveys people between the ages of 16 and 65 and includes an assessment of cognitive skills (literacy, numeracy and problem-solving in a technology-rich environment). In traditional educational psychology, Bloom's taxonomy on cognitive domains is perceived as a core reference in the field and distinguishes between Low, Medium and Higher Order cognitive skills. However, Bloom's work on the hierarchical nature of cognitive skills has not been referenced by the OECD in its PIAAC documentation. This paper demonstrates – through a text-based analysis of the PIAAC's definitions of skills levels – that the OECD's description of cognitive skills resembles keywords used by Bloom but does not explicitly define these through a hierarchical approach. Instead, high level cognitive skills are mainly characterized through the ability to apply cognitive strategies to unfamiliar contexts outside the adults' immediate life circumstances.

Bone, Robert M. (2003) *The Geography of the Canadian North: Issues and Challenges*, Toronto: Oxford University Press.

This text looks at the dual relationship of the Canadian north as both resource frontier and homeland of many Aboriginal groups. It offers a rich, realistic interpretation of the human geography of the North. Discusses the physical geography and the history of more than three-quarters of our nation, examines northern and native development, and outlines some geographic realities for the 1990s as northerners move from the fur economy and subsequent dependence on governments to the promise of self-government in Nunavut and Denedeh.

Borell, Belinda; Moewaka Barnes, Helen McCreanor, Tim "Conceptualising historical privilege: The flip side of historical trauma, a brief examination." AlterNative: An International Journal of Indigenous Peoples 14.1 (2018): 25-34.

Historical trauma is an important and growing area of research that provides crucial insights into the antecedents of current-day inequities in health and social wellbeing

experienced by Indigenous people in colonial settler societies. What is not so readily examined is the flip side of historical trauma experienced by settlers and their descendants, what might be termed "historical privilege." These historic acts of privilege for settlers, particularly those emigrating from Britain, provide the antecedents for the current-day realities for their descendants and the structural, institutional, and interpersonal levels of advantage that are also a key feature of inequities between Indigenous and settler. This article theorises an explicit link between historical trauma and historical privilege and explores how the latter may be examined with particular reference to Aotearoa New Zealand. Three core elements of historical trauma are posited as a useful framework to apply to historical privilege.

Borghans, L., Ter Weel, B., & Weinberg, B. A. (2014). People skills and the labor-market outcomes of underrepresented groups. *Ilr Review*, *67*(2), 287-334.

In this article, the authors show that people skills are important determinants of labor-market outcomes, including occupational choice and wages. Technological and organizational changes have increased the importance of people skills in the workplace. The authors particularly focus on how the increased importance of how these skills have affected the labor-market outcomes of underrepresented groups, assuming that gender differences in interactions and cultural differences and prejudice may impede cross-racial and ethnic interactions. Estimates for Britain, Germany, and the United States are consistent with such an explanation. An acceleration in the rate of increase in the importance of people skills between the late 1970s and early 1990s in the United States can help explain why the gender wage gap closed and the black-white wage gap stagnated in these years relative to the preceding and following years.

Boughton, Bob, Frances Williamson, Sophia Lin, Richard Taylor, Jack Beetson, Ben Bartlett, Pat Anderson & Stephen Morrell (2022): Measuring adult English literacy improvements in First Nations communities in Australia, International Journal of Training Research, DOI: 10.1080/14480220.2022.2032268

The prevalence of low to very low adult English literacy levels in First Nations communities in Australia continues to be an issue, despite ten years of government-supported Foundation Skills training provided through the national vocational education and training system. This study examines an innovative First Nations community-controlled approach to improving adult literacy training, utilising an internationally recognised mass campaign model. Literacy improvements were assessed for 63 participants in 6 communities, using validated pre- and posttests aligned to the Australian Core Skills Framework (ACSF). Overall, 73% of participants improved their literacy, defined as moving up at least one level on one or more of six ACSF indicators. The number of lessons completed, and entry ACSF literacy levels were significantly associated with literacy progression, with previous school education positively

associated but not statistically significant. The minimum number of lessons associated with literacy improvement is estimated as 47–49 (80–83% of lessons).

Boulet, Virginie and Nadine Badets, (2017) Early motherhood among Off-Reserve First Nations, Métis and Inuit women Insights on Canadian Society Statistics Canada Catalogue no. 75-006-X ISSN 2291-0840

This study uses data from the 2012 Aboriginal Peoples Survey (APS) to examine the prevalence of early motherhood (i.e., having become a mother before the age of 20) among First Nations women living Off-Reserve, Métis women and Inuit women aged 20 to 44. Data from the 2011 General Social Survey (GSS) are used for non-Aboriginal women. The study also examines whether early motherhood is associated with different outcomes in terms of education and employment.

Brant-Birioukov, K. (2021) 'Covid-19 and Ingenuity: Lessons from Indigenous resilience, adaptation, and innovation in times of crisis', Prospects (Paris), 51(1-3), 247–259.

In the midst of the global Covid-19 pandemic, educators are invited to pause and reconsider the legacies this crisis will leave for future generations. What lessons do we take forward in a post-Covid-19 curriculum? This article contemplates the value of Indigenous resilience, innovation, and adaptation in times of crisis—"In(di)genuity," if you will—and considers its implications on Indigenous knowledge and the curricular discourse more broadly. Despite encouraging developments in Indigenous education since the Truth and Reconciliation Commission, a settler historical consciousness continues to pervade the modern discourse of Indigenous education, insofar as Indigenous knowledge is often perceived as outdated, irrelevant, or inferior to Western knowledge systems. This problematic misconception ignores the resilience, innovation, and adaptation that Indigenous peoples have demonstrated in the face of historical crises. This article offers an Indigenous perspective on crisis, grief, and renewal in the context of Covid-19 and advocates for the renewal of the Canadian curricular landscape.

Brassington, Laura (2022) *Gypsies, Roma and Travellers: The ethnic minorities most excluded from UK education,* HEPI Report 151, https://www.hepi.ac.uk/wp-content/uploads/2022/07/Gypsies-Roma-and-Travellers.pdf

This report synthesizes data from the Higher Education Statistics Agency (HESA), the Office for Students (OfS) and the UK Government, as well as secondary literature and evidence presented to two relevant committee meetings held in Parliament on GRT issues. It further draws on interviews with members of the GRTSB communities; academics specializing in GRTSB access to education from the University of Sussex, Anglia Ruskin University and Buckinghamshire New University; and conversations and

correspondence with GRTSB charities and individuals involved in outreach work at several higher education institutions.

Brunello, G., Wruuck, P. (2021) 'Skill shortages and skill mismatch: A review of the literature', Journal of Economic Surveys, 35(4), 1145–1167.

We review the recent economic literature on skill shortages and skill mismatch by paying particular attention to the demand side of skill mismatch, which have not received much attention in the relevant literature. We discuss measurement issues and how skill shortages and mismatch vary both with the business cycle and with structural factors. We review the economic costs for workers and firms and conclude by considering the policy implications, including how responsibilities for skill development can best be shared and what role policies can play to better address skill shortages and mismatches.

Calver, M. (2015). Closing the Aboriginal education gap in Canada: The impact on employment, GDP, and labour productivity. *International Productivity Monitor*, (28), 27.

Despite improvements between 2001 and 2011, Canada's Aboriginal population continues to underperform in the labour market. The Aboriginal educational attainment gap is often seen as the major source of these disparities. Using data from the 2011 National Household Survey, projections of Aboriginal population growth, and forecasts of aggregate economic conditions, we estimate the economic impact of closing the educational attainment gap by 2031. We find that the benefits of achieving such a feat could be very large, both for the Aboriginal population and for the country as a whole. Closing the education gap would raise Aboriginal employment by 90 thousand workers, GDP by $28.3 billion (2010 dollars) and Aboriginal employment income by $11,236 per worker in 2031. Labour productivity would increase by 0.03 percentage points per year over the 2011-2031 period. Assuming improvement occurs at a constant pace, we estimate that the cumulative gains to Canadian GDP would be as large as $261 billion (2010 dollars) over the 2011-2031 period.

Cai, Jinghong, & Dianne Gut (2020). Literacy and Digital Problem -solving Skills in the 21st Century: What PIAAC Says about Educators in the United States, Canada, Finland and Japan, Teaching Education, 31:2, 177-208.

The purpose of our study is to delve into the education gap between the United States and some countries by examining the literacy and digital problem-solving skills of American educators and comparing their performance with that of their peers from Canada, Finland, and Japan. We use PIAAC data collected by the Organization for Economic Co-operation and Development (OECD) and define educators as professionals with the highest level of qualification in the area of teacher training and

education science. Our findings show that, internationally, U.S. educators are at a great disadvantage vis a vis their peers in Finland and Japan in terms of literacy, and they rank the lowest in digital problem-solving skills among the four studied countries. Other key findings include (a) in Canada and Finland, educators perform significantly higher in literacy than non-educators in their respective countries; (b) young educators in the United States (under age 35) lag far behind the same age group in Finland, Japan, and Canada; and (c) in all four countries, digital problem-solving skills of educators tend to decrease as their age increases. All statistical analyses are based on regression using sampling weights.

Camfield, D. (2019). Settler colonialism and labour studies in Canada: A preliminary exploration. *Labour: Journal of Canadian Labour Studies/Le Travail: revue d'Études Ouvrières Canadiennes*, *83*, 147-172.

The 21st century has seen growing attention to settler colonialism among academic researchers in Canada and internationally. In the Canadian context, interest has been fueled above all by an ongoing resurgence of Indigenous activism and intellectual work, of which the most visible expression to most non-Indigenous people was the Idle No More movement of 2012–13. To date, however, little attention has been paid to settler colonialism within labour studies, broadly understood. As a modest contribution to remedying this deficiency, this article argues for the importance of understanding Canada as a settler-colonial society, proposes a conceptualization of settler colonialism from the perspective of a historical materialism reconstructed through engagement with Indigenous anticolonial thought, and offers some preliminary reflections on integrating analysis of settler colonialism into historical and contemporary research on labour.

Canada, Employment and Social Development Canada. Strategic Policy and Research Branch issuing body (2015) Evaluation of the Aboriginal Skills and Employment Training Strategy and the Skills and Partnership Fund: final report. Ottawa: Employment and Social Development Canada.

The ASETS and SPF evaluation covers program activities from April 2010 to January 2014, focusing on three strategic priorities: demand-driven skills development; partnerships; and accountability for improved results. A calibrated approach was adopted for this evaluation, which emphasized areas where knowledge gaps exist, such as ASETS and SPF partnerships and the extent to which demand-driven skills development has taken place, while incorporated multiple lines of enquiry and leveraged previous similar evaluation results where appropriate and necessary.

Caron, J. et al. (2020) Indigenous employees' perceptions of the strategies used by mining employers to promote their recruitment, integration, and retention. *Resources policy*. [Online] 68101793–.

This evaluation report presents key findings and observations regarding the Skills Link stream of the Youth Employment Strategy (hereafter referred to as the Strategy). This report was completed in compliance with the Financial Administration Act and the Policy on Results.

Caron, J., Asselin, H., & Beaudoin, J. M. (2019). Attitudes and behaviors of mining sector employers towards the Indigenous workforce. *Resources Policy*, *61*, 108-117.

Members of Indigenous communities want to improve their socio-economic status. While many are willing to participate in the mining industry, they face multiple barriers to employment. The purpose of this research was to study Indigenous employees' perceptions of the strategies used by Canadian mining employers to promote their recruitment, integration, and retention. Semi-structured interviews with 43 Anishnaabeg, Crees and Inuit from communities near mining projects in Quebec and Nunavut showed that to be effective, employability programs required close collaboration between governments, Indigenous communities, and industry. Liaison, work readiness, site readiness, mentorship, career progression and language training programs were said to promote the recruitment, integration, and retention of Indigenous workers. Facilities and activities valuing Indigenous cultures, a critical mass of Indigenous employees, and quality work relationships were also considered to favor Indigenous employment within mining companies. Cree and Inuit perceptions of the factors promoting their recruitment, integration and retention in the mining industry were similar to those of their employers, while Anishnaabeg rather considered that employers were not making enough efforts. The difference might be explained by the fact that Anishnaabeg have yet to conclude a land claim agreement which would put a legal incentive on companies to implement employability programs.

Cassidy, L., Reggio, K., Shaywitz, B.A., Holahan, J.M., Shaywitz, S.E. (2021) 'Dyslexia in Incarcerated Men and Women: A New Perspective on Reading Disability in the Prison Population', Journal of correctional education (1974), 72(2), 61–81.

The authors report findings on reading and IQ from a contemporary study of 145 individually tested incarcerated men and women in two maximum-security prisons in Louisiana. To their knowledge this study is the first to use the definition of dyslexia from the First Step Act (FSA) and the first to incorporate an IQ measure to differentiate those with dyslexia from individuals with cognitive impairment. The authors' findings indicate that almost half (47%) of the participants are classified as having dyslexia, 36% proficient, and 17% cognitive impairment. Both dyslexic prisoners and non-dyslexic prisoners reported academic and behavioral problems in school that led to decreased years in school and decreased high school graduation rates, with 87% reporting dropping out of school with many inmates dropping out in middle school (mean age of

completion of 9.6 years of school), 97% reporting having been in special education or received accommodations, and 59% having failed to receive a high school diploma or equivalency. The authors note that although the FSA calls for the Bureau of Prisons to screen prisoners for dyslexia using a screener that is evidence-based, with proven psychometrics for validity, efficiency and low cost, as well as readily available, a screener is not a diagnostic instrument, and we discuss the next steps after inmates are screened as being dyslexic.

Chartrand, V. (2019) 'Unsettled Times: Indigenous Incarceration and the Links between Colonialism and the Penitentiary in Canada', Canadian journal of criminology and criminal justice, 61(3), 67–89.

The high rate of Indigenous incarceration is a well-documented problem throughout Canada. Within mainstream discourses, this problem is often framed as the legacy or effects of colonialism, which has resulted in the systemic racism and cultural and socio-economic deprivation experienced by Indigenous people today. An increasing body of scholarly literature is challenging the assumption that colonialism is something of the past by looking at how its structures and logics persist today. Thus far, however, little consideration has been given to the colonial context and emergence of Indigenous incarceration in Canada. By tracing the historical links between modern colonialism and the emergence of the Canadian penitentiary into the present, this research reveals some of the hidden connections that contribute to the current rates of Indigenous incarceration and the relationship that continues to exist between colonialism and the penal system today. These findings highlight a socio-politics of incarceration that go beyond a crime and justice framework.

Cincinnato, S., De Wever, B., Van Keer, H., & Valcke, M. (2016). The influence of social background on participation in adult education: Applying the cultural capital framework. *Adult Education Quarterly*, *66*(2), 143-168.

In this article, we address the issue of participation in adult education building on the cultural capital framework. This theoretical framework suggests that (educational) practices are affected by one's social background and, more precisely, by the cultural resources handed down in the family context. To examine the validity of this theoretical framework, we build on data from the Programme for the International Assessment of Adult Competencies from 23 countries (n = 120,789). The Programme data allow using the variables parents' educational level (a proxy for social background), educational attainment, and readiness to learn as precursors of participation in adult education (both a proxy for cultural capital). Our findings suggest that the cultural capital framework is not fully suited to explain participation in adult education: Although social background has an (indirect) influence on participation, its effect does not concur with theoretical predictions, that is, mediated by the readiness to learn.

Coates, K. and C. Holroyd (2022) "The cool economy Technological innovation and the prospects for a sustainable Arctic economy," in Koivurova, Timo and Natcher, David C. Renewable Economies in the Arctic (2022) Taylor & Francis, pp: 46-61.

This book offers multidisciplinary perspectives on renewable economies in the Arctic and how these are being supported scientifically, economically, socially, and politically by Arctic states. The economic development of the Arctic region is witnessing new, innovative trends which hold promise for the sustainable development of the region. This book discusses the emerging forms of renewable economies to understand where intellectual and technological innovations are being made. It draws on the expertise of scholars from across the Arctic and provides the reader with a foundation of knowledge to identify the unique challenges of the region and explore opportunities to unlock the immense potential of renewable resources to boost the region's economy. This book offers a holistic Arctic perspective against the backdrop of prevailing social, economic, and climatic challenges. With critical insights on the economic state of play and the role of renewable resources in the development of the Arctic region, this book will be a vital point of reference for Arctic scholars, communities, and policy makers.

Coates, K., Finnegan, G., Hall, C., & Lendsay, K. (2015). *Unearthing human resources: Aboriginal skills development and employment in the natural resource sector*. Ottawa: A Macdonald-Laurier Institute Publication.

This study reveals that resource companies are indeed major employers of Aboriginal workers. In northern Saskatchewan for example, the two large uranium companies, Cameco and Areva, employ Aboriginal people as more than 50 percent of their northern workforce. And wages for resource jobs are significantly higher than most jobs available to Aboriginal workers. Corporate, government and Aboriginal training programs are proliferating.

Cohen, Alice, Melpatkwa Matthew, Kate J. Neville & Kelsey Wrightson (2021) Colonialism in Community-Based Monitoring: Knowledge Systems, Finance, and Power in Canada, Annals of the American Association of Geographers, 111:7, 1988-2004,

Community-based monitoring (CBM) programs are increasingly popular models of environmental governance around the world. Accordingly, a handful of review papers have highlighted the various benefits, challenges, and governance models associated with their uptake. These reviews have been pragmatic in their recommendations and have supported CBM scholars and practitioners in implementing and understanding the various possible forms of CBM, but they have largely been silent on issues around the power dynamics implicit in CBM. Structured around explorations of the colonial politics of knowledge, funding, and finance, this article argues that dominant knowledge

systems—specifically those that underpin Western, colonial governments and liberal, capitalist economies—shape the provisioning of funding for local programs and determine the significance of different types of community observations in shaping management decisions. To make this argument, we situate our work at the intersection of political economy and knowledge systems, using theoretical insights and empirical examples to show that funding and finance are key sources of power in shaping CBM programs. These are important insights because CBM is often framed as a purely scientific—and therefore politically neutral—activity. Through this work, we explore questions of intellectual property, histories of institutional exclusion and the privileging of certain knowledge systems, and the relationships of trust and mistrust across different groups and authorities, with the aim of stimulating critical discussions on the power relationships in CBM that will be useful to scholars and practitioners.

Colbourne, R., Moroz, P., Hall, C., Lendsay, K., & Anderson, R. B. (2019). Indigenous works and two eyed seeing: mapping the case for Indigenous-led research. *Qualitative Research in Organizations and Management: An International Journal*.

The purpose of this paper is to explore Indigenous Works' efforts to facilitate Indigenous-led research that is responsive to the socio-economic needs, values, and traditions of Indigenous communities. Design/methodology/approach This paper is grounded in an Indigenous research paradigm that is facilitated by Indigenous-led community-based participatory action research (PAR) methodology informed by the Two Row Wampum and Two-Eyed Seeing framework to bridge Indigenous science and knowledge systems with western ones. The findings point to the need for greater focus on how Indigenous and western knowledge may be aligned within the methodological content domain while tackling a wide array of Indigenous research goals that involve non-Indigenous allies. This paper addresses the need to develop insights and understandings into how to develop a safe, ethical space for Indigenous-led trans-disciplinary and multi-community collaborative research partnerships that contribute to community self-governance and well-being.

Cook, Anna. 2018. "Recognizing Settler Ignorance in the Canadian Truth and Reconciliation Commission." Feminist Philosophy Quarterly 4 (4). Article 6.

The Canadian Truth and Reconciliation Commission (TRC) has been mandated to collect testimonies from survivors of the Indian Residential Schools system. The TRC demands survivors of the residential school system to share their personal narratives under the assumption that the sharing of narratives will inform the Canadian public of the residential school legacy and will motivate a transformation of settler identity. I contend, however, that the TRC provides a concrete example of how a politics of recognition fails to transform relationships between Native and settler Canadians not only because it enacts an internalization of colonial recognition, but because it fails to

account for what I call "settler ignorance." Work in epistemologies of ignorance and epistemic oppression gives language to explain sustained denial and provide tools to further understand how settler denial is sustained, and how it can be made visible, and so challenged. For this task, Mills's articulation of white ignorance should be expanded to a consideration of white settler ignorance. Over and above an account of white ignorance, such an account will have to consider the underlying logics of settler colonialism. This characterization of settler ignorance will show that the denial of past and ongoing violence against Indigenous peoples, through the reconstruction of the past to assert the primacy of settlers, is not explainable in terms of a lack of recognition but is rather structural ignorance.

Coulthard, Glen Sean. (2014) *Red Skin, White Masks: Rejecting the Colonial Politics of Recognition.* Minneapolis: University of Minnesota Press.

Coulthard challenges recognition as a method of organizing difference and identity in liberal politics, questioning the assumption that contemporary difference and past histories of destructive colonialism between the state and Indigenous peoples can be reconciled through a process of acknowledgment. He examines an alternative politics, seeking to revalue, reconstruct, and redeploy Indigenous cultural practices based on self-recognition.

Council of Ministers of Education, Canada (2021) *Skills in the Canadian Labour Market Findings from the Programme for the International Assessment of Adult Competencies (PIAAC)*, Employment and Social Development Canada.

This report shows the distribution of information-processing skills (literacy, numeracy, and problem solving in technology-rich environments [PS-TRE]) among Canadian labour force participants aged 16 to 65 based on data from the Programme for the International Assessment of Adult Competencies (PIAAC), an international assessment led by the Organisation for Economic Co-operation and Development (OECD). The report focuses on the distribution of information-processing skills among Canadian workers across occupational groups, industries, and selected job characteristics. It also illustrates the relationship between skill proficiencies and labour market outcomes, providing evidence of how higher skills are associated with the probabilities of being employed or unemployed. It also examines the relationship between skills and earnings (from employment).

De Bruin, Anne, and Peter Mataira. "Indigenous entrepreneurship." *Entrepreneurship: New perspectives in a global age*. Routledge, 2018. 169-184.

This chapter contends that entrepreneurial activity, at multiple levels, is a crucial element of any action package to enhance the self-sustaining economic

development of Indigenous peoples. The relatively low socio-economic status of Indigenous peoples in developed countries is a matter of significant concern. The chapter discusses the tri-levels of entrepreneurial activity. Firstly, the concept of heritage entrepreneurship is explained and mainly illustrated by drawing on the study of recent claims made by Maori, under the Treaty of Waitangi. The next level of tribal entrepreneurship is delineated with the principal elements for the success of this model drawn out. At the third level of entrepreneurship discussed – Indigenous self-employment, the supporting role of government assistance is drawn attention to, and an associated definition of commercial viability set out. The broad notion of advancing Indigenous economic development is fundamentally linked to Indigenous peoples' efforts to reduce their reliance on government benefits and to reassert their sovereign claims.

Dinku, Y. et al. (2020) How might COVID-19 affect the Indigenous labour market? *Australian
journal of labour economics.* 23 (2), 189–210.

Macroeconomic shocks and the policy responses to those shocks have significant effects on Australia's economy. However, research into impacts of such shocks on the Indigenous labour force is limited. This paper explores how the COVID-19 crisis is likely to affect Indigenous labour market outcomes in future. While this paper briefly examines the immediate consequences of the COVID-19 crisis for Indigenous economic outcomes, it discusses the likely longer-run consequences for Indigenous employment at some length. The sectoral concentration of Indigenous employment, the relatively high levels of casual employment and the relatively young age profile of the Indigenous population may increase Indigenous exposure to significant economic risks. Indigenous business disproportionately employs Indigenous workers, but such businesses are concentrated in small to medium enterprises that may be sensitive to recessionary conditions, especially if economic uncertainty leads to a more generalised financial crisis involving liquidity constraints. Recent history demonstrates that Indigenous employment rates have increased only gradually in the long period of macroeconomic growth leading up to the pandemic. Historical disadvantage, discrimination and geographical constraints are important drivers of the dynamics of Indigenous labour market disadvantage, which limit educational attainment and ability to find work. For those Indigenous people who secure employment, it can be difficult to retain employment. COVID-19 is likely to lead to an intense period of structural adjustment in the economy, and it is important for the Indigenous community and businesses to position themselves to take advantage of potential opportunities and minimise potential risks. The ongoing digital divide may be a particular problem for Indigenous people accessing work remotely. Poor access to the internet of a substantial number of Indigenous households may also exacerbate access to remote education. Such issues have important implications for addressing Indigenous disadvantage in future.

Durda, T., Gauly, B., Buddeberg, K., Lechner, C.M., Artelt, C. (2020) 'On the comparability of adults with low literacy across LEO, PIAAC, and NEPS. Methodological considerations and empirical evidence,' Large-scale assessments in education, 8(1), 1–34.

In Germany, three large-scale surveys–the Level One Study (LEO), the Programme for the International Assessment of Adult Competencies (PIAAC), and the National Educational Panel Study (NEPS)–provide complementary data on adults' literacy skills that can be harnessed to study adults with low literacy. To ensure that research on low-literate adults using these surveys arrives at valid and robust conclusions, it is imperative to ascertain the comparability of the three surveys' low-literacy samples. Towards that end, in the present study, we comprehensively assess the comparability of adults with low literacy across these surveys with regard to their sociodemographic and socioeconomic characteristics. These results: The key insight our study provides is that–despite different sample representations and measurement approaches–the low-literacy samples in the three surveys are largely comparable in terms of their socioeconomic and sociodemographic characteristics. Although there were small differences between the surveys with regard to the distribution of gender, educational attainment, and the proportion of non-native speakers within the group of low-literate adults, results revealed that both the prevalence of low literacy and its correlates were largely robust across LEO, PIAAC, and NEPS. Across all three surveys, lower educational attainment emerged as the most significant correlate of low literacy, followed by a non-German language background, unemployment and low occupational status. Conclusions: Our study provides evidence that all three surveys can be used for investigating adults with low literacy. The small differences between the low-literacy samples across the three surveys appear to be associated with sample representation and certain assessment features that should be kept in mind when using the surveys for research and policy purposes. Nevertheless, our study showed that we do compare apples with oranges when dealing with low-literate adults across different large-scale surveys.

Edelman, M. (2021) 'Hollowed out Heartland, USA: How capital sacrificed communities and paved the way for authoritarian populism', Journal of rural studies, 82, 505–517.

— are spreading in historically white rural areas and small towns across the United States. Rural decline, rooted in economic restructuring and financialization, causes severe stress, exacerbates racial resentment, and creates a breeding ground for regressive authoritarian politics. A multidimensional approach must analytically connect long-term and recent trends affecting economy and livelihoods, institutions, health, and community life. The "racial resentment" and "economic distress" explanations for authoritarian populism are inextricably connected. Since the 1980s, and in intensified

form after the 2008 financial crisis, capital has systematically undermined the institutions — mutually-owned banks, credit unions, mom-and-pop businesses, family farms — that fostered reinvestment of locally-produced wealth, especially but not only in rural areas. While many Trump voters were affluent suburbanites, another important sector of supporters consists of downwardly mobile inhabitants of zones where financialization and austerity destroyed the institutions that earlier allowed people to appropriate the wealth that they produced and where the social safety net, always fragile, is increasingly in tatters. The United States now has a poor and near-poor majority. Scholars and the media have underestimated the human toll of this crisis and the interconnectedness of the multiple processes of social decomposition affecting rural zones.

Egert, B., de la Maisonneuve, C., Turner, D. (2022) A New Macroeconomic Measure of Human Capital Exploiting PISA and PIAAC: Linking Education Policies to Productivity, OECD Economics Department Working Papers No. 1709. Paris: OECD and Policy File, CESifo Group Munich.

This paper provides a new measure of human capital using PISA and PIAAC surveys, and mean years of schooling. The new measure is a cohort-weighted average of past PISA scores (representing the quality of education) of the working age population and the corresponding mean years of schooling (representing the quantity of education). In contrast to the existing literature, the relative weights of each component are not imposed or calibrated but directly estimated. The paper finds that the elasticity of the stock of human capital with respect to the quality of education is three to four times larger than for the quantity of education. The new measure has a strong link to productivity with the potential for productivity gains being much greater from improvements in the quality than quantity component of human capital. The magnitude of these potential gains in MFP is comparable to a similarly standardized improvement in product market regulation, but the effects materialize with much longer lags. The paper demonstrates through the example of pre-primary education, how to simulate the impact of a particular reform to education policy on human capital and productivity. The magnitude of these potential gains in MFP is comparable to a similarly standardized improvement in product market regulation, but the effects materialize with much longer lags. The paper demonstrates through the example of pre-primary education, how to simulate the impact of a particular reform to education policy on human capital and productivity. The magnitude of these potential gains in MFP is comparable to a similarly standardized improvement in product market regulation, but the effects materialize with much longer lags. The paper demonstrates through the example of pre-primary education, how to simulate the impact of a particular reform to education policy on human capital and productivity.

Ens, E., Savoie-Chabot, L., See, K., & Wee, S. L. (2021). *Assessing Labour Market Slack for Monetary Policy* (No. 2021-15).

We propose a way to assess the health of the labour market more comprehensively than has been done before. By providing a clearer picture of key turning points in the economic recovery from the pandemic, this approach could help mitigate potential risks to inflation from extended low policy rates. This new, detailed approach allows us to identify important areas of weakness (or strength) in the labour market. This approach could also improve understanding of whether labour market weakness is driven by cyclical factors or by long-term structural trends like digitalization, although this is not an area of focus of this paper.

Ewert, S., Sykes, B.L., Pettit, B. (2014) 'The Degree of Disadvantage: Incarceration and Inequality in Education', The Annals of the American Academy of Political and Social Science, 651(1), 24–43.

This article examines how the rise in incarceration and its disproportionate concentration among low-skill, young African American men influences estimates of educational attainment in the United States. We focus on high school graduation rates and the persistent gap in attainment that exists between young black and white Americans. Although official statistics show a declining racial gap in high school dropout in recent years, conventional data sources exclude the incarcerated population from sample data. We show how those exclusions underestimate the extent of racial inequality in high school graduation and underestimate the dropout rate among young black men by as much as 40 percent. America's prisons and jails have become repositories for high school dropouts, thereby obscuring the degree of disadvantage faced by black men in the contemporary United States and the relative competitiveness of the U.S. workforce.

Exner-Pirot, Heather (2021) *Pathways to Indigenous Economic Self-Determination: How resource development supports independence for Indigenous communities.* Ottawa: A Macdonald-Laurier Institute Publication.

This report explores the evolution of Indigenous engagement in resource development and demonstrates how that sector offers amongst the best opportunities for Indigenous nations and peoples to develop their own economies and achieve greater self-determination in practice. The majority of First Nations are involved in resource development to some extent, including oil and gas, mining, forestry, hydro and commercial fisheries. Significant Indigenous engagement in the sector has resulted from legal rights, contractual demands, and the need for social license, but also Indigenous business acumen and persistence.

Fan, L. et al. (2017) Returns to education and occupations for Canadian Aboriginal people. International journal of social economics. [Online] 44 (12), 2224–2237.

The purpose of this paper is twofold. First, drawing on a unique data set, the authors estimate the returns to education for Canadian Aboriginal people. Second, the authors explore the relationship between occupation and the economic well-being, measured as income, of Aboriginal people in an effort to provide a better understanding of the causes of income gaps for Aboriginal people. Design/methodology/approach - The data used in this study is the Public Use Microdata File of Aboriginal People's Survey, 2012. An ordered logit model is used to estimate the key determinants for income groups. Then the marginal effects of each variable, for the probability of being in each category of the outcomes, are derived. Findings - All the explanatory variables, including demographic, educational and occupational variables, appeared statistically significant with predicted signs. These results confirmed relationships between income level, education, and occupations. Research limitations/implications - The data limitation of income, as a categorical variable prevents the precise estimation of the contributions of the dependent variables in dollar amount. Social implications - In order to substantially improve the Aboriginal people's market performance, it is important to emphasize the quality of their education and whether their areas of study could lead them to high-skilled occupations. Originality/value - Attention is paid to the types of human capital rather than the general term of education.

Feir, D., & Thomas, J. (2019). Introduction of Formal Child Care Services in Inuit Communities and Labour Force Outcomes. *Canadian Public Policy*, *45*(4), 428-459.

We study the impacts of the introduction of formal childcare services in 28 Inuit communities in Canada's North. We use geographical variation in the timing of the introduction of childcare services in the late 1990s and early 2000s to estimate the impact of increased access to childcare. We combine the 1996, 2001, and 2006 long-form census files with data on the opening dates of childcare centres in each of the 28 communities over time. We find little evidence of impacts on female labour force participation rates. Point estimates for other outcomes, including high school graduation rates and male participation in childcare, are also mostly small and statistically insignificant. In many cases, subgroups in Quebec present the exception, potentially reflecting an interaction with the low fee childcare policy that was rolled out in Quebec over approximately the same time period. We do not find evidence that formal childcare availability decreases the ability of children to speak Inuktitut. We suggest plausible explanations for these findings and avenues for future research.

Feir, D. et al. (2021) The Distributional Impacts of Active Labor Market Programs for Indigenous Populations. AEA papers and proceedings. [Online] 111216–220.

We evaluate the distributional impacts of active labor market programming for Indigenous peoples in Canada. Using administrative data and an empirical strategy that compares participants in high-intensity programs—skills interventions, job-creation partnerships, or wage subsidies—to those in low-intensity programs, such as employment assistance or job counseling, reveals large returns to high-intensity programming for above-median earnings. Returns are largest for women at the mean, suggesting that high-intensity programming may reduce gender gaps in earnings among participants, who represent 10 percent of all Indigenous people in Canada. Larger returns at the top of the distribution indicate that overall inequality among participants could increase.

Finnegan, G.F. (2012) 'The Mysterious Ways of Statistics for Aboriginal People in the Yukon: The Ownership and Interpretation of Data', Aboriginal policy studies (Edmonton, Alberta, Canada), 2(1).

This article outlines three challenges that were brought to YBS's attention, by First Nations people, organizations, or governments, regarding the challenges they were facing in managing or understanding data flowing out of Statistics Canada—or, in some cases, how data was not flowing at all.

Finnegan, G.F. (2013) Analyzing the Role of Aboriginal Public Administration in Yukon – The Survey of Employment and Payroll Hours, *aboriginal policy studies, Vol. 2 no. 2: pp. 88-107.*

This paper tracks the rise of First Nations government employment and the wages earned by this sector since the rise of the self-government movement in Yukon, and represents, to the best of our knowledge, the first-time this Statistics Canada dataset has been used to assess the impact of Aboriginal self-government in Canada. In this paper, we compare Yukon Aboriginal government employment and wages to data from across Canada and in the North (NWT and Alaska). Since the finalization of the Umbrella Final Agreement (UFA) in 1990, eleven (11) Yukon First Nations have brought into effect Final Land Claim Settlements and Self-Government Agreements.

Finnegan, G., and John Jacobs (2015) "Canadian interprovincial employees in the Canadian Arctic: a case study in fly-in/fly-out employment metrics, 2004–2009," *Polar Geography,* Volume 38, Number 3, 3 July 2015, pp. 175-193(19)

One of the ongoing debates in Arctic labor research is the impact of the fly-in/fly-out worker populations on northern labor markets. A problem that researchers encounter is the lack of standardized national metrics for tracking migratory employees. However, a long-awaited dataset deriving from Statistics Canada's Alberta Shadow Population research using Canada Revenue Agency information has recently become available,

which provides statistics on fly-in/fly-out workers in the Canadian North. This data set provides an overview of Receiving Employees by Canadian province and territory, which gives us our first glimpse at annual counts of the number of fly-in workers being received by each of the Canadian territories for the period 2004–2009. This latest information allows us to begin to explore the possible impacts of fly-in workers on northern labor markets in Nunavut, Northwest Territories, and Yukon using comparisons to well-vetted data sets from Statistics Canada's Labour Force Survey and other national accounts. The information indicates that the North became more reliant on fly-in workers during the period 2004–2009 and that in Nunavut, while the number of fly-in workers increased annually, so too did unemployment and the number of people not in the labor force.

Finnegan, G., & Coates, K. (2016). Île-à-la-Crosse Northern Village, Saskatchewan: A New Approach to Understanding Northern Communities. *Northern Review* (Whitehorse), (42), 131-175.

The Arctic Council Sustainable Development Working Group (SDWG) has been developing socio-economic indicators (SEI) for the Arctic for over a decade, with an emphasis on finding and applying indicators that speak to the people and cultures of the Arctic. The SDWG's work is encapsulated in three studies: the Arctic Human Development Report 2004 (AHDR), the Arctic Social Indicators 2010, and case studies that were captured in Arctic Social Indicators 2013. In this study, we apply the ASI 2010 indicators to the northern Saskatchewan Métis community of Ile a la Crosse, using the available Canadian and Saskatchewan socio-economic indicators, in order to test the applicability of the ASI 2010 methodology to a northern provincial community. In this exercise, we were hampered by the failure of the National Household Survey of 2011 and the dearth of published provincial socio-economic indicators. For instance, the 2013 case studies indicate that territorial governments in the far north provide a greater wealth of applicable ASI 2010 data for remote Indigenous communities than does the province of Saskatchewan. Finally, the federal government of Canada continues to demand fees for services in order to access data from sources as essential as the Aboriginal People's Survey (APS) 2012 limiting access to data that is critical for the analysis of resiliency and inequality in Indigenous communities. Overall, we found that the Arctic social indicators provided a clear and concise picture of the social inequalities that exist between northern and southern Saskatchewan, while also demonstrating the strength and resiliency of this Métis community.

Fitzgerald, H.E., Johnson, D.J., Allen, J., Villarruel, F.A., Qin, D.B. (2021) 'Historical and Race-Based Trauma: Resilience Through Family and Community', Adversity and resilience science, 2(4), 215–223.

This literature review examines the various responses to trauma suffered by Indigenous peoples as a result of governmental policies geared toward assimilation. Both traumatic and resilient responses are demonstrated at the individual, family, and community levels. Much of the research that has been done in the United States to develop theories around historical trauma and race-based traumatic stress may also be applied to Canada's First Nations due to similar histories of oppression and colonization. Overall, the research finds that self-government and a connection to culture and spirituality result in better outcomes for Indigenous peoples.

Flanagan, A. M. H. (2015). Engaging First Nations children in summer learning. *Antistasis*, *5*(2), pp: 90-100.

Literacy research reveals that early literacy and reading skills are related to and are strong predictors of later reading ability and success in school (Lonigan, Purpura, Wilson, Walker, & Clancy-Menchetti, 2013; Lonigan, Schatschneider, & Westberg 2008). Our competence in these skills affects us socially, emotionally, and physically. In 2012, the Programme for the International Assessment of Adult Competencies (PIAAC) showed that 17% of Canadian working-age adults (16-65) have extremely poor literacy skills (Hayes, 2013; Statistics Canada, 2013). These individuals may be unable to, for example, determine the correct amount of medicine to give a child from information printed on the bottle. A staggering 32% of Canadian adults have poor literacy skills and can deal with materials and tasks that are simple, clearly laid out, and not too complex (Canadian Council on Learning, 2008a). This group of adults may have developed coping strategies to deal with daily routines and other literacy demands but they may have difficulty with novel tasks (Canadian Council on Learning, 2008a; Hayes, 2013). Although these are adult literacy levels, literacy development begins at birth, and so begin the trajectories of vulnerability for academic challenges. The time to prevent low literacy skills is in the early years (Carroll, Bowyer-Crane, Duff, Hulme, & Snowling, 2011).

Gladun, Elena, Soili Nysten-Haarala, Svetlana Tulaeva (2021) Indigenous economies in the Arctic: To thrive or to survive? *Elementa: Science of the Anthropocene,* 10.1525/elementa.2019.00088

There is a growing global interest in Arctic natural resources that have a strong influence on the local economies. The Arctic economy is a rather unique phenomenon encompassing Indigenous practices, local economic activities, and industrial development. Indigenous economies vary across the Arctic states and exhibit divergent economic mixtures. In globalizing societies and full market economies, traditional Indigenous economies are changing and perceived especially by the non-Indigenous to be a tribute to old customs rather than a way of life that is being followed by the young generation. However, certain groups of the contemporary Indigenous populations in the

Arctic continue to preserve their culture and ensure the continuation of Indigenous ways of life. The development of Indigenous communities is intricately linked to their economic well-being, on the one hand, and to their culture and traditions, on the other. Our article contributes to the discussion on the significance of Indigenous economies in providing sustainability in terms of Indigenous communities, their culture, and traditions. The research objective is to identify strategies and tools that sustain Indigenous economies as well as the goals of various stakeholders in encouraging and supporting the traditional economic activities of Indigenous peoples. We contrast three countries—Russia, Finland, and the United States (Alaska)—and discuss some governmental strategies that can be employed for preserving unique Indigenous economies. The research methods consist of a content analysis of state and regional legislation and strategies, social studies of stakeholders' opinions, case studies describing market infrastructure, and economic activities as well as features of traditional lifestyles and Indigenous knowledge typical of these regions.

Goldmann, G., & Racine, A. (2021). "Show Me the Money": The Returns to Education for Indigenous Canadians. *Canadian Studies in Population*, *48*(2), 293-313.

Research has shown a strong link between the acquisition of human capital and success in the labour market as measured through employment income. While this relationship has been demonstrated for the non-Indigenous population, it is not clear whether it necessarily holds true for the Indigenous peoples of Canada. This paper examines the returns to education (as a component of human capital) for the three Indigenous groups in Canada—First Nations, Métis, and Inuit. The results of multivariate regression models constructed using data from the 2011 National Household Survey and the 2012 Aboriginal Peoples Survey show that the returns to post-secondary education for Indigenous peoples are significantly positive and, in some instances, comparable to those for the non-Indigenous population.

Gordon, H.S.J., Datta, R. (2022) 'Indigenous Communities Defining and Utilising Self-determination as an Individual and Collective Capability', Journal of human development and capabilities, 23(2), 182–205.

International law establishes who has rights to self-determination and outlines the rights of Indigenous people through the 2007 United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP). Many countries who are United Nations members, such as those of our case studies, have not made changes to their laws to implement UNDRIP. This affects how Indigenous peoples can engage in capabilities for self-determination for their wellbeing. Drawing from methods that are adapted to be in alliance with Indigenous methodologies through utilising Indigenous relational theoretical frameworks, we present two case studies, one in the U.S. that used ethnographic futures research and one in Bangladesh that used participatory action

research. Our paper critically discusses: (1) how the capability approach relates to Indigenous self-determination and wellbeing, (2) how colonisation affects the ability of Indigenous people to engage in capabilities for self-determination, (3) how Indigenous people define and utilise self-determination as an individual and collective capability for their well-being, and (4) how unfreedoms restrict Indigenous people from utilising the capabilities for self-determination. We hope that this paper will contribute to broadening the capability approach to be able to engage more fully with Indigenous peoples.

Grotluschen, Anke et al (2021). Beyond literacy and language provision: Socio-political participation of migrants and large language minorities in five countries from PIAAC R1/R2, *Journal of Adult and Continuing Education* 2021, Vol. 27(1) 42–62.

Integration is more than work and school: It consists of socio-political participation as well. Even without citizen's rights, migrants have an opinion on whether they 'have a say' in the host or dominant society. This expression – having a say – is emblematic because it is a well-known survey question, also used in the Program for the International Assessment of Adult Competencies (PIAAC). For this article, the authors choose Austria, Canada, Germany, Israel, and the USA to analyse variables on political efficacy and volunteering as indicators for socio-political participation. Using post-colonial and multiple literacy approaches, the authors examine whether migrants and language minorities feel heard. Findings show that first-generation migrants in four countries feel low political efficacy and are excluded from volunteering. However, when taking literacy proficiency into consideration, many effects for political efficacy disappear. For large language minorities, however, controlling for literacy has no effect on their socio-political exclusion.

Grotlüschen, A. & Buddeberg, K. (2020). PIAAC and the South – Is Southering the new Othering? Global Expansion of dominant Discourses on Adult Literacy. *European Journal for Research on the Education and Learning of Adults*, *11*(2), 167–181.

Large-scale studies such as Programme for the international assessment of adult competencies (PIAAC) are currently the most influential variant of literacy research. PIAAC is undergoing a process of regional expansion towards countries located in the geographical south. Based on the finding that large-scale studies can create stereotypes about social groups, this contribution examines the extent to which this danger also exists with regard to countries and regions. For doing so we suggest the term southering. Southering brings together the discourses about the South with the concept of othering, introduced by Said (1978). The presentation of the results as tables and world maps can result in exposing countries of the South to a pronounced deficit perspective. The contribution does not pursue the goal of questioning the legitimacy of international studies. Rather, we would like to point out the necessity of exercising due care in the interpretation of corresponding study results.

Grotlüschen, Anke. (2020). People who teach regularly: What do we know from PIAAC about their professionalization? *Journal of Adult and Continuing Education*, vol:26 iss:1 pp: 125 -148.

Professionalization in adult education is necessary, and several initiatives are underway to improve the professional situation as well as the competences and skills of adult educators. The relevance and importance of adult education is often stated. Large-scale assessments such as the Programme for the International Assessment of Adult Competences show how important adult education is for societies and economies. They give information on participation and participants. At first glance, the Programme for the International Assessment of Adult Competences lacks detailed information on adult education institutions and professions. A second glance allows explore what people do as part of their work. Those who state that they teach regularly or occasionally will be explored here in more detail. Findings from this study reveal several characteristics of people who teach, including age, gender, academic background, and industries. In particular, our analysis suggests that more than 80% of those who teach did not have formal degrees in education sciences. Moreover, those who teach frequently have higher skills, older ages and they have better job positions than those who do not teach. The majority of those who teach are males. Lastly, the results indicate that seniority and prestige in all 14 countries examined in this study are highly relevant to people who teach.

Guner, N. (2017). Introduction to the special issue on the Survey of Adult Skills (PIAAC). Series: *Journal of the Spanish Economic Association*, 8(4), 311-314.

This special issue brings together five articles on the Survey of Adult Skills (PIAAC). The PIAAC measures the proficiency of 16–65-year-olds in literacy, numeracy and problem solving in technology-rich environments. The main motivation for the survey is that these cognitive skills are critical inputs for success in the labor market. There were two rounds of data collection for the PIACC. In the first round, which took place during 2011 and 2012, a total of 166,000 adults between the ages of 16 and 65 were surveyed in 21 countries: Australia, Austria, Belgium (only Flanders), Canada, Cyprus, the Czech Republic, Denmark, England (and separately Northern Ireland), Estonia, Finland, France, Germany, Ireland, Italy, Japan, Korea, the Netherlands, Norway, Poland, Russia, the Slovak Republic, Spain, Sweden and the United States. The second round took place during 2014 and 2015 in 9 additional countries with a total of 50,250 adults. The countries that participated in the second round were Chile, Greece, Indonesia, Israel, Lithuania, New Zealand, Singapore, Slovenia, and Turkey. OECD (2016) provides details on the survey and an overview of the key facts.

Haan, M., Chuatico, G., & Cornetet, J. (2020). Aboriginal Earnings in Canada: The Importance of Gender, Education, and Industry. *Canadian Ethnic Studies*, *52*(2), 1-27.

The contrasting social and economic inequalities that exist between Indigenous and non-Indigenous peoples has been the focus of many Canadian studies. Several interlinking factors have been found to impact the socioeconomic status of Canada's Indigenous peoples, including social distance, education, gender, and occupational characteristics. Few of these studies, however, look at the gender wage gap amongst Indigenous populations, and in this paper, we identify some of the factors that drive both income and differences in income between men and women, amongst Indigenous peoples. Using data from the 2017 Aboriginal Peoples Survey (APS), we examine key socioeconomic factors and identify how these are linked to income. We find that education and employment industry are major indicators of socioeconomic status, as are the interactions between gender and income. We also find a persistent gender wage gap amongst Canada's Indigenous peoples, but we find that this gap can be explained by differences in the returns to education, skill levels, and industry of employment.

Hageman, Anya and Pauline Galoustian, (2020) *Economic Aspects of the Indigenous Experience in Canada,* Open Library, https://openlibrary-repo.ecampusontario.ca/jspui/handle/123456789/900

This text explores the economic history and economic potential of Indigenous peoples in Canada. It discusses which institutional arrangements hold them back economical and which institutions assist them going forward, and considers which norms do Indigenous communities hold that inform their priorities and economic behaviour. Chapters 1 and 2 introduce the Indigenous Peoples of Canada – First Nations, Métis and Inuit – and their current demographic and income statistics. Chapters 3-12 describe their cultures, economies and geopolitics up until the late twentieth century. Chapters 13 and 14 discuss how discrimination against minorities can be modeled and measured. Finally, Chapters 15+ describe present-day issues in the economic development of Indigenous communities.

Hahmann, Tara, Henry Robertson, and Nadine Badets (2019) Employment characteristics of Métis women and men aged 25 to 54 in Canada. Statistics Canada, 2019 Aboriginal People's Survey, Catalogue no. 89-653-X2019002

The Métis population is young and growing, with the population rising 51.2% from 2006 to 2016 (Statistics Canada, 2018a). The average age of the Métis population at 34.7 years in 2016, was 6.2 years younger than the average age of the non-Aboriginal population. Employment rates varied by age group with 75% of core working age adults (25 to 54 years of age), 52% of youth (15 to 24 years of age), and 39% of older adults (55 years and older) being employed in 2016. A majority of Métis aged 15 years and

older were employed in permanent positions (85%) (Robertson, 2018). Métis experience inequalities in the labour force that are reflected in lower employment and participation rates, higher unemployment rates, and greater vulnerability to economic downturns when contrasted with the non-Aboriginal population (Arriagada, 2016; Moyser, 2017a). However, high school completion rates and the pursuit of postsecondary education are on the rise among Métis, a promising trend given that higher education is found to better the chances of employment (Arriagada, 2016; Moyser, 2017a).

Tara Hahmann, Ph.D., Nadine Badets, and Jeffrey Hughes (2019) *Aboriginal Peoples Survey: Indigenous people with disabilities in Canada: First Nations people living off reserve, Métis and Inuit aged 15 years and older,* Ottawa: Statistics Canada. Catalogue no. 89-653-X

There is limited research on disability types among Indigenous peoples. Much of the research conducted on these populations has approached the topic from the perspective of chronic health issues rather than disability. For instance, according to the 2008/2010 First Nations Regional Health Survey, based on First Nations adults living on reserve and in Northern communities, the most frequently reported chronic health conditions were chronic back pain (16.2%), hearing impairment (8.8%), blindness or vision problems (3.6%), learning disability (3.6%), and cognitive or mental health issues (1.2%). Previous studies on pain among Indigenous peoples in Canada and the United States have found markedly higher rates of reported pain overall and in specific areas of the body (e.g., back, head, neck, joints) when compared with the non-Indigenous population (Jimenez, Garroutte, Kundu, Morales, & Buchwald, 2011). These studies provide important contextual information about the health problems faced by First Nations people living on reserve and Indigenous peoples more generally. The present study seeks to fill a knowledge gap by providing a profile of First Nations people living off reserve, Métis, and Inuit living with a disability using data from the 2017 Aboriginal Peoples Survey (APS). The APS is a unique national survey designed to collect information on the social and economic conditions of Indigenous peoples in Canada.

Hall, R. (2021). Indigenous/state relations and the "Making" of surplus populations in the mixed economy of Northern Canada. *Geoforum*, *126*, 461-470.

Grounded in an analysis of the mixed economy of the Northwest Territories (NWT), Canada, this article examines the contemporary relationship between surplus populations and colonial capitalist accumulation of new spaces. The functioning of the reserve surplus population requires that the unwaged, or under-waged, want, or need, wage labour. Thus, like all capitalist relations, a reserve surplus population is predicated on the separation of workers from their means of subsistence: what Marx calls "primitive" accumulation. Traditionally the home of the Dene and Inuit, and now home to

approximately equal parts Indigenous (primarily Dene, Inuit, and Métis) and non-Indigenous residents, the NWT mixed economy is a set of social relations that combine subsistence and social reproduction, wherein labour is oriented toward the daily and intergenerational wellbeing of the collective rather than the profit of the individual, with capitalist production. With a focus on the diamond industry, this article traces the shifting Canadian State approach to Indigenous labour in this space across time and the state policies and extractive projects that have both "made" Indigenous labour surplus and rhetorically justified their existence through evocations of regional unemployment and imagined dependency. In so doing, the paper identifies a move from the welfare-state era, wherein the state structured northern Indigenous "dependency," to the neoliberal era, wherein dependency became a problem to be solved through increased Indigenous incorporation into capitalist wage labour. The northern diamond mining industry, responding to both Indigenous demands for land recognition and neoliberal imperatives for lean operations, exemplifies this latter approach.

Hamel, M., Laniel, N. (2014) 'Producing official statistics via voluntary surveys -- the National Household Survey in Canada', Statistical journal of the IAOS, 30(3), 237–242.

Statistics Canada conducts over 350 business, social and institutional surveys a year. Of all social or household type surveys, only one in addition to the Census of Population is conducted on a mandatory basis, the Labour Force Survey. By their very nature, voluntary surveys will achieve lower rates of response and are thus exposed to higher risks of bias. For the 2011 Census of Population program, the long form census was for the first time collected on a voluntary basis as the National Household Survey. The survey content was basically the same as that of previous Census long forms and covered various socio-demographic topics that are of high importance to a wide variety of stakeholders in Canada. Given that one of the key characteristics of a census is to produce data for small regions and for subgroups of the population, collecting the survey on a voluntary basis introduced several challenges. Statistics Canada, based on its extensive experience with voluntary surveys, developed a number of processes and approaches to ensure the highest data quality possible. This paper describes what these measures were for data collection, data processing and estimation. It also provides a brief description of the quality assurance processes underlying the release strategy of the 2011 survey.

Hanushek, E. A., Piopiunik, M., & Wiederhold, S. (2019). Do smarter teachers make smarter students? *Education Next*, *19*(2), 57-64.

Student achievement varies widely across developed countries, but the source of these differences is not well understood. One obvious candidate, and a major focus of research and policy discussions both in the United States and abroad, is teacher

quality. We look at whether differences in the cognitive skills of teachers can help explain differences in student performance across developed countries.

Health Canada and Public Health Agency of Canada (2017), Evaluation of the Aboriginal Head Start in Urban and Northern Communities Program 2011-2012 to 2015-2016, Office of Audit and Evaluation, Health Canada and Public Health Agency of Canada.

No abstract.

Heckman, J. (2017), Four big benefits of investing in early childhood development, https://heckmanequation.org/resource/4-big-benefits-of-investing-in-early-childhood-development/

Improving the economy, strengthening the middle class and reducing the deficit are national priorities. Solving these challenges starts with investing in America's greatest resource: its people. Quality early learning and development programs for disadvantaged children can foster valuable skills, strengthen our workforce, grow our economy and reduce social spending.

Heid, O., Khalid, M., Smith, H., Kim, K., Smith, S., Wekerle, C., Bomberry, T., Hill, L.D., General, D.A., Green, T.J., Harris, C., Jacobs, B., Jacobs, N., Kim, K., Horse, M.L., Martin-Hill, D., McQueen, K.C.D., Miller, T.F., Noronha, N., Smith, S., Thomasen, K., Wekerle, C. (2022) 'Indigenous Youth and Resilience in Canada and the USA: a Scoping Review', *Adversity and resilience science*, 3(2), 113–147.

Relative to non-Indigenous youth, Indigenous youth have been under-represented when studying pathways to mental wellness. Yet, a broad range of adversity is acknowledged, from intergenerational and ongoing trauma arising from colonial policies. This scoping review explores resilience definitions, measures, key stressors, and what Indigenous youth identify as pathways to their wellness, based on quantitative and qualitative peer-reviewed literature in Canada and the Continental United States. Eight databases (EBSCO, PsycINFO, Science Direct, Social Science Citation Index, Web of Science, PsycARTICLES, and EMBASE) and hand searches of 7 relevant journals were conducted to ensure literature coverage. Two independent reviewers screened each article, with one Indigenous screener per article. The final scoping review analysis included 44 articles. In articles, no Indigenous term for resilience was found, but related concepts were identified ("walking a good path," "good mind," Grandfathers' teachings on 7 values, decision-making for 7 generations into the future, etc.). Few Indigenous-specific measures of resilience exist, with studies relying on Western measures of psychological resilience. Qualitative approaches supporting youth-led resilience definitions yielded important insights. Youth stressors included the following: substance

use, family instability, and loss of cultural identity. Youth resilience strategies included the following: having a future orientation, cultural pride, learning from the natural world, and interacting with community members (e.g., relationship with Elders, being in community and on the land). Indigenous traditional knowledge and cultural continuity serve as prominent pathways to Indigenous youth resilience. More research is needed to yield a holistic, youth-centered measure of resilience that includes traditional practices.

Heisig, Jan Paul, Benjamin Elbers & Heike Solga (2020). Cross-national differences in social background effects on educational attainment and achievement: absolute vs. relative inequalities and the role of education systems, *Compare: A Journal of Comparative and International Education*, 50:2, 165-184.

We use PIAAC data to study the relationship between parental education and educational success among adults from 23 advanced economies. We consider educational success in terms of both educational *attainment* (formal qualifications) and educational *achievement* (competencies) and in both *absolute* and *relative* terms (i.e., as the individual's rank in the distribution of educational success). Parental education effects are stronger for educational attainment than for achievement in all countries. Cross-national variation in the strength of social background effects follows broadly similar patterns for the different ways of measuring success, but a few countries combine relatively strong achievement with relatively weak attainment effects and *vice versa*. Tracking in secondary education is associated with stronger background effects for educational attainment but not for achievement. Greater prevalence of formal (non-formal) AET is associated with stronger (weaker) background effects for both attainment and achievement, while vocational orientation of upper secondary education does not matter much.

Hikaru Komatsu & Jeremy Rappleye (2021). Rearticulating PISA, Globalisation, Societies and Education, 19:2, 245-258.

The OECD's PISA exercise has by now been widely critiqued. Whilst we agree with most concerns, we begin with the assumption that PISA will remain an enduring and powerful feature of the global educational landscape. Even if the PISA test itself were discontinued, a similar large-scale quantitative assessment exercise would soon arise to take its place. As such, we focus herein on strategies for rearticulating ILSAs such as PISA: the creative use of data to shift the exercise away from dissemination of one dominant worldview towards the recognition of alternatives. To do this, we discuss the approach and findings from our recent papers, and then suggest future directions. Rather than mere accommodation, re-articulation underscores an approach to critique that is generative for theory and practice, one that extends of the horizon of possibility beyond culturally saturated notions of 'good' education.

Hoicka, C.E., Savic, K., Campney, A. (2021) 'Reconciliation through renewable energy? A survey of Indigenous communities, involvement, and peoples in Canada,' Energy research & social science, 74, 101897–

Reconciliation is about the genuine restructuring and transformation of the relationships between Indigenous and settler people. Although renewable energy has not been inherently positive for Indigenous peoples, Indigenous communities in Canada have been participating in renewable energy production, which presents a potential pathway to reconciliation, climate change mitigation and a just energy transition. This study explores whether and to what extent community energy—defined by deep engagement in process, as well as local and collective benefits—relates to elements of participation associated with reconciliation, both conceptually and empirically. A conceptual framework based in community energy was developed to characterize and analyse 194 renewable energy projects associated with Indigenous communities. This framework considered 'community' as belonging to traditional land, places where Indigenous people live, and as local authority, such as the Indigenous political organization of a settlement or reserve. Projects were examined by legal form, project location, and control. The findings do not provide strong indications of reconciliation. We suggest that one pathway to reconciliation is equity ownership, which has risen over time, although most projects located on traditional territories and Indigenous communities generally have minority or no ownership. There were no projects associated with Métis communities, and only 6 associated with Inuit communities. Institutional change requires implementation of free, prior and informed consent (FPIC) and extensive policy supports. Further research with and by Indigenous communities should examine how to support equity ownership by examining the findings of the 41 projects controlled by Indigenous communities and increased attention to Métis and Inuit communities.

Holcombe, S., & Kemp, D. (2019). Indigenous peoples and mine-automation: An issues paper. *Resources Policy*, *63*, 101420.

The global mining sector, like other sectors of industrialised economies, is undergoing a technological trans-formation as part of what some commentators refer to as the 'fourth industrial revolution.' New technologies, such as automation and robotics, are transforming the nature of mining and the nature of work. This paper discusses the implications of this shift for Indigenous peoples and the Indigenous mining workforce. In the past two decades the number of Indigenous employees in the sector has grown to unprecedented levels, most notably in Australia and Canada. The emergence of local level agreements, state regulatory requirements, and mining company policies and commitments are examined as drivers for this rise in Indigenous employment. Yet, the predicted acceleration in mine automation could disrupt this positive trend, as automation targets routine jobs which are disproportionately where Indigenous peoples

are employed in manual and semi-skilled roles. There is little indication that the industry is considering the potential downside effects of mine automation on these same peoples. A careful and critical examination of mine automation and its effects on Indigenous peoples is urgently required.

Hossain, A. et al. (2021) Indexes of employability assets: a comprehensive tool for analyzing students' attitudes in Indigenous contexts. Higher education, skills, and work-based learning. [Online] 11 (4), 773–797.

The purpose of this study is to analyze the indexes of employability assets that affect students' employability in Indigenous contexts. The study restructures the indicators developed from the survey the authors did for the Vital Outcome Indicators for Community Engagement (VOICE) research project into six employability indexes. The six indexes are reading and comprehension, numeracy, technological mastery, contribution to organizational performance, job searching skills and cultural awareness. The study has applied mixed research method, which is the combination of survey and secondary data analyses.

Hu, M., Daley, A., & Warman, C. (2019). Literacy, numeracy, technology skill, and labour market outcomes among Indigenous Peoples in Canada. *Canadian Public Policy*, *45*(1), 48-73.

We use the 2012 Program for the International Assessment of Adult Competencies to examine the relationship between information-processing skills, educational entertainment, and labor market outcomes among Indigenous peoples in Canada. Relative to the non-Indigenous sample, we find negative differential earnings, higher unemployment, and lower employment and labor market participation among Indigenous peoples, as well as important differences between First Nations, Métis, and Inuit workers. First Nations peoples show larger gaps in terms of earnings and employment outcomes. Moreover, Métis peoples show worse employment outcomes and negative earnings differentials in the upper part of the distribution. First Nations peoples also show sizable gaps in literacy, numeracy, and technology skill relative to the non-Indigenous sample. Not surprisingly, there is a positive relationship between information-processing skills and wages. However, the returns to skills are very similar for Indigenous and non-Indigenous peoples. That is, we find no evidence of economic discrimination. Once these skills are conditioned on, the earnings differentials decline. We also find that education can reduce skill and wage gaps, although the additional impact is small. The results imply the need to consider barriers to education faced by Indigenous peoples. Although the additional impact is small, the results imply the need to consider barriers to education faced by Indigenous peoples.

Hu, Min, (2019). *Three Essays on Labour and Health Outcomes of Vulnerable Populations in Canada,* Submitted in partial fulfilment of the requirements for the degree of Doctor of Philosophy at Dalhousie University Halifax, Nova Scotia.

This dissertation contains three essays examining the labour market and health outcomes of vulnerable populations in Canada. The first essay examines the relationship between information-processing skills, educational attainment, and labour market outcomes among Indigenous peoples in Canada, and uses the 2012 Programme for the International Assessment of Adult Competencies (PIAAC). Relative to the non-Indigenous sample, this study finds negative earning differentials, lower information-processing skills, higher unemployment, lower employment, and labour market participation among Indigenous peoples. The results show a positive relationship between skills and earnings and there is no evidence of economic discrimination based on the returns to skills which are very similar for both groups. The results also imply the need to consider barriers to education faced by Indigenous peoples. The second essay measures and examines the gender gaps in the health status among Indigenous adults living Off-Reserve in 2001, 2006 and 2012 with three corresponded Aboriginal People Surveys (APS). It shows that the self-rated general health gap between Indigenous males and females widened from 1.6 to 5.2 percentage point between 2001 and 2012. Oaxaca-Blinder decomposition shows that differences in the observable characteristics between males and females explain more than half of the gender difference in good general health. Specifically, the results indicated that improving socioeconomic status and participation in traditional activities of females to the level of males will effectively reduce the gender health gap among Indigenous peoples in Canada. The third essay investigates the causal detrimental effect of Ramadan fasting during pregnancy on infant birth weight and fraction of male births in Canada. With seven million birth record from 1990-2016 Canadian Vital Statistics Birth Record, and large variation in daylight hours within geographic locations over time, as well as across locations, this study also enables estimations of a large amount variation in Ramadan fasting hours. The results show that babies of Muslim mothers have lower average birth weight and are more likely to be below the low birth threshold. Moreover, once the extreme fasting hours are removed, modest reductions are found in birth weight associated with Ramadan falling on the ninth, seventh or fifth month of pregnancy.

Indigenous Services Canada (2020). Annual Report to Parliament 2020, Catalogue: R1-114E-PDF ISSN 2563-2981 ©Her Majesty the Queen in Right of Canada, 2020.

This first annual report to Parliament is organized into three parts. Part 1 provides a broad overview of the socioeconomic gaps between First Nations, Inuit, and Métis peoples, and the non-Indigenous population in Canada. It covers a wide range of social, economic, and health dimensions, ranging from income and education through life

expectancy and language use, and highlights not only what gaps exist today, but how those gaps have evolved over time. This section also highlights why measurement is so important, and the ongoing work being done to address persistent data gaps to make measurement more effective.

Jovicic, S. (2016). Wage inequality, skill inequality, and employment: evidence and policy lessons from PIAAC. *IZA Journal of European Labor Studies*, *5*(1), 1-26.

This paper investigates international differences in wage inequality and skills and whether a compressed wage distribution is associated with high unemployment across core OECD countries. Wage dispersion and wage structure are widely debated among policymakers; compressed wage structure is often perceived as an important cause of high unemployment. Firstly, this paper examines differences in wage dispersion across OECD countries and their link to skill dispersion. Some countries that have more compressed (dispersed) wage structures simultaneously have more compressed (dispersed) skill structures as well, and skill differences explain part of the differences in wage dispersion. However, even when accounted for skills, some countries have a more compressed wage structure, most likely caused by labor market institutions. We do not find an effect of wage compression on the labor market performance in the low-skill sector. Based on the Program for International Assessment of Adult Competencies (PIAAC) survey of adult skills for core OECD countries, this paper cannot confirm the skill compression nor wage compression hypotheses. Rather than insisting on the deregulation of labor market institutions and reductions in public welfare policy as the main policy recommendations to achieve higher employment (and higher wage inequality), policymakers should reconsider aggregate demand deficiency and the variation in macroeconomic policies as potential explanations for the employment differences across countries.

Jensen, T., Sandström, J. (2020) 'Fly-in/fly-out and the fragmentation of communities: A case study of a uranium mine on Indigenous land', *Journal of Rural Studies*, 78, 78–86.

The article presents a case analysis of the work regime at a uranium mine, located on Indigenous land in northern Saskatchewan, Canada. All the miners are flown in and out (FIFO), and with nearly half the workforce coming from different Indigenous communities. We ask how the miners participate in and experience life as FIFO workers and enroll the community concept in the analysis. Defining community as not merely a group of people or a place but also, in the wake of Tönnies' classic work, as a matter of attitude, the case analysis reveals a community at work but fragmentation of Indigenous communities off work.

Jin, Q. (2021) Supporting Indigenous Students in Science and STEM Education: A Systematic *Review Education Science*., 11, 555.

There are a growing number of education programs in science and STEM education with the aim of improving educational outcomes for Indigenous students who have long been underrepresented in current education systems. The aim of this study is to systematically review empirical research from 2011 to 2020 that reported programs to support Indigenous students in science and STEM education. A total of 24 studies were included in this review. These programs involved student participants from all K to 12 grade levels and occurred in both formal and informal contexts. Most of the programs employed multifaced approaches, and cultural relevance and scientific inquiry practice were the two main features of the programs. All the programs had reported positive outcomes in relation to Indigenous students' science learning, understanding of their own cultures and traditions, and/or the complementarity of Western science and Indigenous knowledge.

Kepkiewicz, Lauren & Bryan Dale (2019) Keeping 'our' land: property, agriculture and tensions between Indigenous and settler visions of food sovereignty in Canada, The Journal of Peasant Studies, 46:5, 983-1002.

This paper situates literature on food sovereignty and land reforms in relation to academic and popular writings about land issues in Canada. We argue that settler Canadian food sovereignty scholarship and activism has yet to sufficiently grapple with the implications of private property ownership in relation to ongoing processes of settler colonialism. We also argue that efforts to advance ecologically sustainable farming practices in Canada need to confront private property ownership in terms of its contribution to both capitalist and colonial violence.

Khuong Truong N.T. and Arthur Sweetman (2018). Basic Information and Communication Technology Skills among Canadian Immigrants and Non-Immigrants, *Canadian Public Policy / Analyse de Politiques*, Vol. 44, No. S1, pp. S91-S112.

Male immigrants are disproportionately employed in information and communication technology (ICT) industries and occupations in Canada. The authors use a measure of basic ICT skills to document differences in skill levels, and those skills' relationship with labour market earnings, across immigration classes and categories of Canadians at birth. Adult immigrants, including those assessed by Canada's points system, have lower average ICT scores than Canadians at birth, although the rate of return to ICT skills is not statistically different between them. Immigrants who arrive as children and the Canadian-born children of immigrants have similar outcomes as the Canadian-born children of Canadian-born parents.

Kim, Paul J. (2019) "Social determinants of health inequities in Indigenous Canadians through a life course approach to colonialism and the residential school system." *Health Equity* 3, no. 1: 378-381.

Indigenous populations in Canada have experienced social, economic, and political disadvantages through colonialism. The policies implemented to assimilate Aboriginal peoples have dissolved cultural continuity and unfavorably shaped their health outcomes. As a result, Indigenous Canadians face health inequities such as chronic illness, food insecurity, and mental health crises. In 2015, the Canadian government affirmed their responsibility for Indigenous inequalities following a historic report by the Truth and Reconciliation Commission of Canada. It has outlined intergenerational traumata imposed upon Aboriginals through decades of systemic discrimination in the form of the Residential School System and the Indian Act. As these policies have crossed multiple lifespans and generations, societal conceptualization of Indigenous health inequities must include social determinants of health (SDOH) intersecting with the life course approach to health development to fully capture the causes of intergenerational maintenance of poor health outcomes. To provide culturally sensitive care for those who have experienced intergenerational trauma, health care providers should be aware of and understand two key SDOH inequity influencing the Indigenous life course, including the residential school system and loss of socioeconomic status, over time due to colonialism.

Kim, M. (2017). Climate Change, Traditional Roles, and Work: Interactions in the Inuit Nunangat. In *Climate Change and Gender in Rich Countries* (pp. 150-166). Routledge.

The Canadian context often sees climate change framed as the result of over-consuming and unsustainable lifestyles being complemented by high levels of resource extraction in "dirty" industries. Reusing a term from a 2014 UN climate summit, this chapter is about the "front lines" of climate change in Canada. It looks at the implications of climate change for the Canadian Arctic ("the Arctic") and the Inuit communities that reside there. Existing research in this realm has been conducted at the micro-level and through the scope of qualitative case studies and anthropological research. The chapter begins with a summary of this research and identifies common themes that exist across Inuit communities. It analyzes macro-level indicators to corroborate the stories that have emerged so far. The chapter shows that traditional divisions of labour may condition Inuit vulnerability and adaptive capacity to climate change along gendered lines – including one's "employability".

Kirsch, I., & Lennon, M. L. (2017). PIAAC: a new design for a new era. *Large-scale Assessments in Education*, 5(1), 1-22.

As the largest and most innovative international assessment of adults, PIAAC marks an inflection point in the evolution of large-scale comparative assessments. PIAAC grew from the foundation laid by surveys that preceded it and introduced innovations that have shifted the way we conceive and implement large-scale assessments. As the first fully computer-delivered survey of adults, those innovations included: a comprehensive assessment design involving multistage adaptive testing; development of an open-source platform capable of delivering both cognitive measures and nationally-specific background questionnaires; automated scoring of open-ended items across more than 50 languages; enhanced cognitive measures that included electronic texts and interactive stimuli; the inclusion of new item types and response modes; and the use of log file and process data to interpret results. This paper discusses each of these innovations along with the development of data products and dissemination activities that have extended the utility of the survey, providing today's policy makers with information about the extent to which adults possess the critical skills required for both their own success and the health and vibrancy of societies around the world. As this paper suggests, the innovations introduced via PIAAC broadened the relevance and utility of the survey along with the accuracy and validity of the data, strengthening the foundation upon which future surveys can continue to build.

Kral, Inge, Lyn Fasoli, Hilary Smith, Barbra Meek, and Rowena Phair (2021) OECD Working Group: A Strong Start for Every Indigenous Child OECD Education Working Paper No. 251.

This Working Paper was developed to assist policy makers, education, and Indigenous leaders, as well as education practitioners, to better support Indigenous children's early learning and well-being. The paper focuses on early year's policies and provision in Aotearoa New Zealand, Australia, and Canada. It sets out a synthesis of evidence on children's early development, with a particular focus on the conditions and approaches that support positive outcomes for Indigenous children. The Working Paper then outlines a set of promising initiatives that seek to create positive early learning environments for Indigenous children. Drawing on the available evidence and promising approaches, the paper presents a framework for strengthening Indigenous children's early learning and well-being.

Kumar, M. B., Furgal, C., Hutchinson, P., Roseborough, W., & Kootoo-Chiarello, S. (2019). *Harvesting Activities Among First Nations people Living Off-Reserve, Métis, and Inuit: Time Trends, Barriers, and Associated Factors*. Statistics Canada.

Harvesting activities such as hunting, fishing, trapping, and gathering wild plants have been part of Indigenous peoples' ways of living for millennia. They have endured despite the impact of colonization, including the impacts of residential schools, relocation to permanent settlements and introduction of the wage economy. This paper

examines trends in harvesting activities, specifically hunting, fishing, or trapping and gathering wild plants or berries, among First Nations people living Off-Reserve, Métis and Inuit using four cycles of the Aboriginal Peoples Survey (2001, 2006, 2012 and 2017). It also explores self-reported barriers to participation in harvesting activities and associated factors.

Lamb, D., & Verma, A. (2021). Nonstandard Employment and Indigenous Earnings Inequality in Canada. *Journal of Industrial Relations*, 00221856211021128.

The study investigates the extent to which the type of employment, specifically nonstandard work, may contribute to a better understanding of Indigenous earnings disparities. We find that Indigenous workers are overrepresented in nonstandard jobs and that such forms of work are associated with sizable earnings penalties. Although Indigenous earnings disparities are *smaller* in nonstandard work than in standard employment, the relatively low earnings of many nonstandard jobs are an important factor contributing to the overall economic inequalities experienced by many Indigenous Canadians. Policy responses aimed at improved human capital accumulation are likely to have limited efficacy unless additional barriers that prevent many Indigenous workers from accessing better quality employment and internal labor markets are identified and removed.

Landahl, Joakim (2020). The PISA calendar: Temporal governance and international large-scale assessments, *Educational Philosophy and Theory*, 52:6, 625-639.

This article analyses international large-scale assessments in education from a temporal perspective. The article discusses and compares the different conceptions of time in the early international assessments conducted in the 1960s and 1970s by the IEA with the PISA studies conducted by the OECD from the year 2000 onwards. The paper argues that there has been a shift in the ways that the assessments' structure time. The early IEA surveys were characterized by a relative slowness, lack of synchronization and lack of trend analyses. PISA, by contrast, is characterized by high pace, simultaneous publication of results around the world and regular and recurrent studies making the analysis of trends possible. The emergence of this new time regime, it is argued, has implications for how education is governed. At the transnational level, it strengthens the influence and importance of OECD as a significant policy actor. At the national level, as educational discourse and policy adapts to the temporalities of the PISA calendar, two kinds of effects can be distinguished. First, there is a tendency towards searching for "retrotopian" solutions for contemporary problems. Second, there is a tendency towards acceleration and short-term planning when it comes to educational reforms.

Lane, Janet and T. Scott Murray (2018) *Literacy Lost: Canada's Basic Skills Shortfall*, Human Capital Centre, Calgary: Canada West Foundation

Workplaces are changing quickly. Machines or algorithms are replacing some tasks, and new and changing jobs require additional technical skills. To keep pace with these changes in current and future jobs, the ability to keep learning is the most important basic skill for any job. Because literacy is the most important "learning to learn skill," Canada's workforce requires high levels of literacy. However, many Canadian workers have poor literacy skills.

Leach, Dawn Madahbee; Baer, Lars-Anders; Yu, Peter. (2020) *Linking Indigenous Communities with Regional Development,* Organisation for Economic Cooperation and Development. The OECD Observer; Paris**.**

We are pleased to have provided leadership and guidance on this report-the first-ever global study of its kind on Indigenous economies and regional development. This work has directly involved Indigenous communities and leaders throughout. It is also timely. As Indigenous peoples worldwide achieve growing legal recognition of their rights as well as title to land and sea, it is imperative that we overcome the implementation gap and translate these rights into better outcomes. Reconciliation involves addressing Indigenous land title along with the meaningful engagement of the original people in planning the protection and sustainable use of lands, water, natural resources, and wildlife. It also demands the inclusion of Indigenous peoples and perspectives in governance and policy design at all levels.

Lee, H.; Bayoumi, I.; Watson, A.; Davison, C.M.; Fu, M.; Nolan, D.; Mitchell, D.; Traviss, S.; Kehoe, J.; Purkey, E. (2021) Impacts of the COVID-19 Pandemic on Children and Families from Marginalized Groups: A Qualitative Study in Kingston, Ontario. *COVID*, *1*, 704-716.

The COVID-19 pandemic has been associated with unprecedented changes to societal structure. School closures, unstable employment, and inaccessible health services have caused enormous disruptions to child and family wellbeing. This study identifies major themes illustrating how child and family wellness were impacted by COVID-19, including unique effects experienced by Indigenous families. In-depth interviews were conducted with key informants (n = 31) recruited from organizations providing healthcare and social services in Kingston, Ontario. Interview transcripts and written survey responses were analyzed using a phenomenological approach to explore themes related to child and family wellbeing. Three major themes identified include school closures, home safety, and outdoor spaces. School closures were generally reported as negatively impacting learning and social development; however, school closures allowed for some Indigenous children to be removed from a colonized education system, contributing to cultural and spiritual growth. Second, respondents reported increased severity and

frequency of domestic violence, which negatively impacted child wellbeing. Third, the closure of public outdoor spaces created barriers to maintaining good physical health for children. This study recommends the prioritization of (1) child learning and development by avoiding school closures in pandemic settings and (2) the safety of Indigenous students by decolonizing education. To address the increased exposure to adverse childhood experiences (ACEs) during COVID-19, we recommend improved training for identifying and reporting domestic violence amongst service providers. Our study also reflects the broader need to redefine "essential services," considering culturally specific services for Indigenous Peoples.

Lee Harvey (2001) Defining and Measuring Employability, *Quality in Higher Education*, 7:2, 97-109.

The concept of employability is analysed and the prevailing tendency to create employability measures based on outcomes is critiqued. The outcome approach results in employability as being construed as an institutional achievement rather than the propensity of the individual student to get employment. The operationalisation of employability as a concept is examined and the implicit 'magic bullet' notion of employability-development opportunities is revealed. An alternative, more complex model is outlined but its applicability is subverted by the 'irrational' activities of graduate recruiters, which render useless any employability indicator based on the proportion of graduates obtaining work. An alternative approach, based on an audit of employability-development within institutions, is explored and some methodological pitfalls are outlined. The conclusion suggests that any evaluation of employability needs clearly to indicate areas for internal improvement rather than simply ranking institutions.

Leigh, Andrew & Xiaodong Gong (2009). Estimating cognitive gaps between Indigenous and non-Indigenous Australians, *Education Economics*, 17:2, 239-261.

Improving cognitive skills of young children has been suggested as a possible strategy for equalising opportunities across racial groups. Using data on four- and five-year-olds in the Longitudinal Survey of Australian Children, we focus on two cognitive tests: the Peabody Picture Vocabulary Test, and the 'Who Am I?' test. We estimate the test score gap between Indigenous and non-Indigenous children to be about 0.3–0.4 standard deviations, suggesting that the typical Indigenous five-year-old has a similar test score to the typical non-Indigenous four-year-old. Between one-third and two-thirds of the Indigenous/non-Indigenous test score gap appears to be due to socio-economic differences, such as income and parental education. We review the literature on test score differences in Australia and observe that our estimated gaps are lower than most of those found in the literature. This implies that the test score gap between Indigenous and non-Indigenous children may widen during school years, a finding that has

implications for policies aimed at improving educational opportunities for Indigenous children.

Li, J., Brar, A., & Roihan, N. (2021). The use of digital technology to enhance language and literacy skills for Indigenous people: A systematic literature review. *Computers and Education Open, 2*, 100035.

Indigenous people have experienced negative inter-generational impacts of colonization and socioeconomic stress, which has led to persistent subpar academic performance compared to non-Indigenous populations. This has prevented Indigenous people from graduating high school and pursuing post-secondary education and professional opportunities. One of their most critical challenges is obtaining adequate language and literacy skills required for success in school and at work. Thus, by a systematic review of 25 empirical studies, this article examines the evidence for the efficacy of using digital technologies to support Indigenous people's learning of language and literacy skills. This research synthesis provides a profile of the studies' comprehensive attributes and responds to five research questions that focus on the effects of, and Indigenous people and educators' perspectives on digital technology use for Indigenous people's learning of language and literacy skills. This article provides insights for teaching practice, and also identifies gaps for future research, instructional designs and implementations that are urgently needed to support Indigenous people, particularly the language and literacy development of Indigenous school children and youth.

Library of Parliament (2021), Broadband Internet in Indigenous Communities, Hill Notes, Ottawa: Library of Parliament. https://hillnotes.ca/2021/12/08/broadband-internet-in-Indigenous-communities/

Broadband Internet access supports Indigenous self-determination by enabling communities to address priorities, improving access to programs and services, supporting economic participation and contributing to the revitalization of Indigenous languages and cultures. However, many Indigenous communities do not have access to reliable, affordable broadband Internet. Indigenous organizations, such as the Assembly of First Nations and Inuit Tapiriit Kanatami, have highlighted the importance of broadband Internet access in Indigenous communities for several years. This HillNote provides information on the availability of broadband Internet and its importance for Indigenous communities.

Lindstrom, G. E. (2018). Trauma and resilience in Aboriginal adult learners' post-secondary experience (Unpublished doctoral thesis). University of Calgary, Calgary, AB.

Informed by my own experiences as an Indigenous adult learner, this study explored the interplay between trauma and resilience in the post-secondary educational experiences of Indigenous adult learners. There were nine participants and I utilized two methods of data collection. In one focus group session, I gathered the perspectives of three post-secondary student support professionals who worked closely with Indigenous adult learners. I conducted single, individual interviews with each of six Indigenous adult learners who were students at one of four major post-secondary institutes in a large city in a Western prairie province. Employing a focused ethnography informed by Indigenous philosophy and Western theory, the purpose of my research was to determine the interplay between trauma and resilience as a potential pathway to improve educational experiences for Indigenous students. One question was central to my research endeavor: how do Indigenous post-secondary students understand and make meaning of their responses to traumatic experiences within a social context that is informed by Canada's colonial history? The focus group session and individual interviews were digitally recorded with the consent of all participants, and personally transcribed. The findings from the data yielded important insights into the ways that trauma experiences and resultant barriers impacted Indigenous students' ability to succeed and highlighted a process of growth that arose from struggle. The students' stories held an overwhelming amount of struggle, suffering, loss and trauma which seemed to surround the student participants as they embarked on their post-secondary educational journeys. However, I found threads of hope scattered across each story. These were the fibres that were woven into the fabric which envelops Indigenous cultures – those unmistakable moments in which the students' perseverance, endurance and determination glimmered brightly and rose above the struggle. A distinct conceptualization of resilience was contextualized within an Indigenous worldview that could be used to inform pedagogical approaches and offers valuable insights for post-secondary administrators and educators into how best to support and foster the success of Indigenous students. My hope is that in sharing these stories of suffering, we can create new opportunities for learning through a pedagogy of resilience.

Lupton, K. A. C. (2019). *Evaluating Key Informant Perspectives on Inuit Self-Determination and Economic Participation in Nunavut* (Doctoral dissertation, Université d'Ottawa/University of Ottawa).

The negotiation of the Nunavut Land Claims Agreement (1993) and subsequent creation of the territory of Nunavut in 1999 have been considered by some to be the beginning of the nation-to-nation reconciliation between the Inuit of the Eastern Arctic and Canada. The institutions of public government that were created through this agreement are intended in part to support Inuit in shaping their economic livelihoods in the territory on their terms. However, it is unclear how territorial and regional planners and decision-makers in positions of power conceptualize "successful economic development" in Nunavut and what implications this could have for Inuit self-

determination. Key informants from the Government of Nunavut (GN) and several Inuit and Land Claims Organizations (ILCOs) were interviewed (n=17) to understand how they conceptualize successful development in the territory and what they think is needed to attain their vision. A framework for Indigenous nation building (Harvard Project on American Indian Economic Development), developed from three decades of research, is used to analyze the interview results. The results of this qualitative analysis indicate that key informants interpret their role toward Inuit self-determination as promoting Inuit participation in Nunavut's market-based, wage-labour economy. This has important implications for possible GN and ILCO coordination and collaboration in their socio-economic efforts on behalf of Nunavummiut.

MacDonald, D., & Hudson, G. (2012). The Genocide Question and Indian Residential Schools in Canada. *Canadian Journal of Political Science, 45*(2), 427-449. doi:10.1017/S000842391200039X

The Truth and Reconciliation Commission has been investigating the array of crimes committed in Canada's Indian Residential Schools. Genocide is being invoked with increasing regularity to describe the crimes inflicted within the IRS system, the intent behind those crimes, and the legacies that have flowed from them. We ask the following questions. Did Canada commit genocide against Aboriginal peoples by attempting to forcibly assimilate them in residential schools? How does the UN Genocide Convention help interpret genocide claims? If not genocide, what other descriptors are more appropriate? Our position might be described as "fence sitting": whether genocide was committed cannot be definitively settled *at this time*. This has to do with polyvalent interpretations of the term, coupled with the growing body of evidence the TRC is building up. We favour using the term cultural genocide as a "ground floor" and a means to interpret the IRS system legally and morally.

MacKinnon, S. (2015) *Decolonizing employment: Aboriginal inclusion in Canada's labour market*. Winnipeg, Manitoba: University of Manitoba Press.

Indigenous North Americans continue to be overrepresented among those who are poor, unemployed, and with low levels of education. This has long been an issue of concern for Indigenous people and their allies and is now drawing the attention of government, business leaders, and others who know that this fast-growing population is a critical source of future labour. Shauna MacKinnon's *Decolonizing Employment: Aboriginal Inclusion in Canada's Labour Market* is a case study with lessons applicable to communities throughout North America. Her examination of Aboriginal labour market participation outlines the deeply damaging, intergenerational effects of colonial policies and describes how a neoliberal political economy serves to further exclude Indigenous North Americans.

Macqueen S, Knoch U, Wigglesworth G, et al (2019). The impact of national standardized literacy and numeracy testing on children and teaching staff in remote Australian Indigenous communities. *Language Testing*; 36(2):265-287.

All educational testing is intended to have consequences, which are assumed to be beneficial, but tests may also have unintended, negative consequences (Messick, 1989). The issue is particularly important in the case of large-scale standardized tests, such as Australia's *National Assessment Program - Literacy and Numeracy* (NAPLAN), the intended benefits of which are increased accountability and improved educational outcomes. The NAPLAN purpose is comparable to that of other state and national 'core skills' testing programs, which evaluate cross-sections of populations in order to compare results between population sub-groupings. Such comparisons underpin 'accountability' in the era of population-level testing. This study investigates the impact of NAPLAN testing on one population grouping that is prominent in the NAPLAN results' comparisons and public reporting: children in remote Indigenous communities. A series of interviews with principals and teachers' documents informants' first-hand experiences of the use and effects of NAPLAN in schools. In the views of most participants, the language and content of the test instruments, the nature of the test engagement, and the test washback have negative impacts on students and staff, with little benefit in terms of the usefulness of the test data. The primary issue is the fact that meaningful participation in the tests depends critically on proficiency in Standard Australian English (SAE) as a first language. This study contributes to the broader discussion of how reform-targeted standardized testing for national populations affects sub-groups who are not treated equitably by the test instrument or reporting for accountability purposes. It highlights a conflict between consequential validity and the notion of accountability that drives reform-targeted testing.

Maehler, D. B., Jakowatz, S., & Konradt, I. (2020). PIAAC Bibliography - 2008-2019. (GESIS Papers, 2020/04). Köln: GESIS - Leibniz-Institut für Sozialwissenschaften.

The present bibliography provides a literature overview for the Programme for the International Assessment of Adult Competencies (PIAAC). PIAAC assesses key cognitive (e.g., literacy and numeracy) and workplace skills of the adult population in over 40 countries. First data was published in 2013 (see OECD, 2013). The PIAAC bibliography aims to gather the different research undertaken with PIAAC and sums up all contributions including Publications of the theoretical conception of the assessed skill domains, Publications of research results based on PIAAC data, The technical conception of the study (as well as follow-up studies) and Published PIAAC data files.

Mahboubi, P. (2019). Bad fits: The causes, extent, and costs of job skills mismatch in Canada. *Commentary - C.D. Howe Institute,* (552).

About 13 percent of Canadian workers have skills mismatched to their jobs. Although this is somewhat in line with an average of around 10 percent among OECD countries in an international survey, Canadian policymakers have two reasons for concern. Firstly, there is significant variation across socioeconomic groups. While workers with higher educational attainment are more likely to be over-skilled, women, immigrants, and older workers are more likely to be under-skilled for their jobs. In the case of immigrants, the under-skilled problem entirely disappears with time spent in Canada, highlighting the importance of settlement policies that provide rigorous and accessible skills training, language programs, and job-search workshops for newcomers. Secondly, these results could worsen in the years ahead in the face of technological development and demographic aging that are occurring in the labour market at the same time as the role of newcomers in Canada's labour force is growing. As it is, the majority of workers across occupations need to use cognitive skills such as literacy, numeracy, and problem solving at least once a week at work. More importantly, there is no occupation where these skills are not required at all. This study's results highlight the importance of providing more opportunities for skills development and lifelong learning for all workers and better addressing individual training needs, particularly, among under-skilled people such as older workers and new immigrants. Businesses – in addition to providing training opportunities for under-skilled workers – can reduce mismatches within their organizations by appropriately reassigning tasks, providing relocation assistance and finding innovative ways to use workers' skills in order to optimize productivity. Governments can help reduce skills mismatch with policies that enhance labour market flexibility, ease labour mobility, and more importantly, increase participation in lifelong learning.

Mahboubi, Parisa and Colin Busby (2017). EDUCATION, SKILLS, AND LABOUR MARKET Closing the Divide: Progress and Challenges in Adult Skills Development among Indigenous Peoples C.D. Howe Institute E-Brief September 6.

Closing the skills gap between working-age Indigenous and non-Indigenous Canadians is essential for the economic success of Canada's Indigenous peoples, according to a report from the C.D. Howe Institute. In "Closing the Divide: Progress and Challenges in Adult Skills Development among Indigenous Peoples," authors Parisa Mahboubi and Colin Busby find both progress and challenges in the adult skills development attained by Off-Reserve Indigenous people, particularly among those without a high-school education, and recommend solutions.

Marques, Olga and Lisa Monchalin (2022) *The Mass Incarceration of Indigenous Women in Canada: A Colonial Tactic of Control and Assimilation, in* L. George et al. (eds.), Neo-Colonial Injustice and the Mass Imprisonment of Indigenous Women, Palgrave Studies in Race, Ethnicity, Indigeneity and Criminal Justice, pp: 79-102.

Focusing on the over-incarceration of Indigenous women in Canada and using Mbembé's (2003) concept of *necropolitics* as a theoretical and analytic point of entry, this chapter seeks to articulate the ways in which the prison is underwritten by racialized colonial histories and practices. That is, we argue that the very colonial practices that historically sought to manage, and assimilate or exterminate, Indigenous peoples, underpin contemporary neoliberal logics that reiterate Indigenous bodies as inherently criminal, victimizable, and requiring punishing and normalizing containment.

Martin, J. (2018), "Skills for the 21st century: Findings and policy lessons from the OECD survey of adult skills", *OECD Education Working Papers*, No. 166, OECD Publishing, Paris.

The OECD Survey of Adult Skills is the jewel in the crown of its Programme for the International Assessment of Adult Competencies (PIAAC). This paper argues that the findings and policy lessons from the project to date justify the high hopes which were placed in PIAAC when detailed planning for the project began in 2003. First, it presents a brief recap of PIAAC and its two predecessor international skills surveys. Second, it outlines the main themes which have been investigated to date using data from PIAAC. Third, the main findings and policy lessons drawn from PIAAC are highlighted. Finally, looking forward to the second cycle of PIAAC, for which planning is now underway, the paper suggests some priority areas for improvement to the survey design in order to add to its analytical usefulness and enhance its utility to policy makers.

Maslov, A, Zhong, J (2020), *Skill mismatch of Indigenous peoples in Canada: findings from*
PIAAC, Kennesaw State University, [Kennesaw], viewed 07 Jan 2022.

Using the Programme for the International Assessment of Adult Competencies (Canadian sample) the paper examines the skill mismatch of Indigenous Off-Reserve peoples. Using several approaches to measuring skill mismatch we find that overskilling does not seem to be an issue for Aboriginal peoples of Canada. However, we do find significant differences in the underskilling rates between Indigenous populations and non-Aboriginal Canadian born. Specifically, First Nations females are more likely to be under-skilled in numeracy, and First Nations males are more likely to be under-skilled in literacy. Inuit peoples show the highest underskilling rates and are much more likely to be under-skilled in literacy and numeracy in comparison to non-Aboriginal Canadian born. We also incorporate skill mismatch rates into the analysis of wages and conclude that it does not change previously documented differentials.

Martínez-Matute, M., Villanueva, E. (2021) 'Task specialization and cognitive skills: evidence from PIAAC and IALS', Review of economics of the household.

We study how the tasks conducted on the job relate to measures of cognitive skills using data from 18 countries participating in the Programme for the International Assessment of Adult Competences (PIAAC) and from 13 countries that also participate in the International Adult Literacy Study (IALS). We document two main findings. Firstly, individual-fixed effect models suggest that low-educated workers specializing in a particular set of basic tasks -say, in numeric relative to reading or ICT tasks- obtain 10% of one standard deviation higher scores in the domain of the PIAAC assessment most related to those tasks than in the rest -say, numeracy relative to literacy or problem-solving scores. Secondly, a synthetic cohort analysis using repeated literacy assessments in IALS and PIAAC indicates that, among the low-educated, long-run increases in the reading task component of jobs correlate positively with increases in cohort-level literacy scores. The results are stronger among low-skilled workers with less working experience or females -i.e., the set of workers who have had less time to sort in the labor market. An interpretation of our findings is that tasks conducted on the job help in building human capital but are imperfect substitutes of formal schooling.

McCue, Harvey (2018). Op-Ed: First Nations Elementary& Secondary School Education –A National Dilemma *Critical Social Work* 19(2)

During the past five years, First Nations elementary-secondary education has been the focus of some useful recommendations in two major reports: The Senate Standing Committee on Aboriginal Peoples in 2011, "Reforming FN Education: From Crisis to Hope," and the 2012 Report of the National Panel on First Nations Elementary-Secondary Education. In response, the Harper government introduced Bill C-33 in 2014, the first-ever federal *First Nations Education Act*. Both reports identified much-needed reforms and despite vociferous opposition by most First Nations leaders the *First Nations Education Act* was a serious effort to accommodate some of them. But neither the reports nor the eventually torpedoed Bill C-33 zeroed in on the three key components that serve as the foundation of any education program: teachers, principals, and the curriculum. If these three elements remain untouched in the new Liberal government's First Nations education policies, First Nations education outcomes will continue to be a national humiliation. This conceptual paper offers a critique of the provincial and federal governments' approaches to remedying the dire condition of elementary and secondary school education for First Nations youth, with a focus on teachers, principals, and curriculum.

McGuire, M.M., Murdoch, D.J. (2021) '(In)-justice: An exploration of the dehumanization, victimization, criminalization, and over-incarceration of Indigenous women in Canada', Punishment & society.

Indigenous women are vastly overrepresented in Canada's federal prisons and represent the fastest growing prison population in Canada. This critical commentary

utilizes a decolonial framework to examine how being Indigenous and female increases one's risk of being victimized, murdered, and subject to colonial control by exploring the connections between the construction of Indigenous women as less than human and the use of carceral space to control, destroy, and assimilate this population. Specifically, the authors apply Woolford and Gacek's notion of genocidal carcerality to the intersectional forces of systemic racism and discrimination that result in their overincarceration. Further, the article critiques the Indigenization of Canada's federal correctional service for failing to meet the needs of this population and for perpetuating an assimilative and stereotypical portrayal of Indigenous women that perpetuates colonial harm.

McKay, Dwanna L. ; Vinyeta, Kirsten ; Norgaard, Kari Marie (2020) "Theorizing race and settler colonialism within U.S. sociology" Sociology compass, 2020-09, Vol.14 (9), p.n/a

Settler colonialism expands race and racism beyond ideological perspectives and reveals the links between historical and contemporary racialized social relations and practices–the racial structure–of American society. In this article, we define settler colonialism, highlight sociological scholarship that uses settler colonial theoretical frameworks, and explore ways in which this work enriches, intersects with, complicates, and contradicts key assumptions within the sociology of race.

McKinley, E. (2016, August 08). *STEM and Indigenous learners* [Paper presentation]. Research Conference 2016 - Improving STEM Learning: What will it take? Copyright Australian Council for Educational Research 2016

Achievement disparities between Indigenous students and their non-Indigenous peers in education continue to be documented across the globe. Over the past three decades, there has been a significant amount of writing on Indigenous methodologies, epistemology and, to a lesser extent, pedagogies. All are crucial in the lifelong process of teaching and learning – the nature of knowledge, how it is gained, and the transmission of it. However, much of this work is contested or seen as inappropriate or irrelevant in STEM education. Indigenous students do not perceive STEM subjects as being welcoming. As STEM educators, we need to take a broader perspective that encompasses the complex interaction of family, social, cultural, educational, economic and political contexts, and to take into account the nature of knowledge and the importance of cultural identity to Indigenous communities. PISA data shows that Indigenous students have an interest in science that is equal to that of their non-Indigenous peers. So, the questions we need to ask are: Why have STEM educators and schools not been able to capitalise on this interest? What makes for effective STEM teaching for Indigenous students? What makes for quality STEM teaching for Indigenous students? What makes for successful learning for Indigenous students in

STEM subjects? This presentation will debate current approaches and ask what more needs to be done.

Miller, T. (2018). Measures of Indigenous achievement in Canada. *Diaspora, Indigenous and Minority Education, 12*(4), 182-200.

The practice of measuring Indigenous achievement dates back to the early 1960s. Since then, Indigenous people have been subjected to a number of different standardized assessments intended to capture indicators of their well-being. Unfortunately, little attention has been given to the cultural appropriateness of subjecting Indigenous people to instruments designed for non-Indigenous populations. Subsequently, there has been reluctance for some Indigenous jurisdictions to participate in standardized large-scale assessments that have now become commonplace throughout the world. The purpose of this literature review was to consolidate literature reporting on the different types of assessments and corresponding outcomes used to measure achievement of Indigenous students in Canada and to synthesize more recent documents reporting on assessment practices and Indigenous student achievement. The outcome of this examination of literature provides insight into how achievement has been measured in the past and how we might transition toward culturally responsive assessment for the future.

Mills, S. (2019) The geography of skill: Mobility and exclusionary unionism in Canada's north. Environment and planning. A. [Online] 51 (3), 724–742.

This paper explores the spatial politics of racism and inter-worker competition through a case study of Indigenous employment during the construction of the Voisey's Bay mine in northern Labrador. Over the course of construction, the building and construction trades unions (BCTUs) sought to restrict the hiring of local Inuit and Innu workers by challenging the legitimacy of place-based entitlements to work. Inuit and Innu workers had preferential access to employment as a result of unresolved land claims and the ensuing Impact and Benefit Agreements (IBA) between the Voisey's Bay Nickel Company and both the Innu Nation and the Labrador Inuit Association. IBA provisions that local Inuit and Innu be hired preferentially ran counter to the unions' organizational structures and cultures, which privileged worker mobility and skill. The BCTUs used the geographic incompatibility between the scale of Indigenous claims and that of construction worker organization to justify a competitive approach to unionism and to veil racist portrayals of Innu and Inuit workers. By drawing out the relation between skill, racism, and beliefs about entitlements to work, this paper explores how workers selectively use place-based and mobile identities to participate in inter-worker competition, reifying colonial patterns of labour mobility and labour market segmentation.

Moyser, Melissa (2017) Aboriginal People Living Off-Reserve and the Labour Market: Estimates from the Labour Force Survey, 2007-2015. Statistics Canada Catalogue no. 71-588-X.

This report provides an overview of the labour market integration of the Off-Reserve Aboriginal population in Canada's ten provinces during and after the 2008/2009 economic downturn, as compared to the non-Aboriginal population. Using annual averages from the Labour Force Survey (LFS), covering the period of 2007 to 2015, the main focus is on Aboriginal people in the core working ages (25 to 54 years), although youth (aged 15 to 24 years) and older adults (aged 55 years and older) are considered separately. In addition to Aboriginal group, labour market indicators are distinguished by gender, geography (province/region of residence), education, lone parenthood, and marital status. The distribution of work characteristics (e.g., self-employment, sector of employment, usual work hours, wages, job tenure, industry, and occupation) by Aboriginal status are also explored.

Mueller, R.E., Truong, N.T.K. (2021) 'Wage and basic skills inequality between immigrants by immigration admission categories and Canadian non-immigrants', Empirical economics, 62(4), 1833–1884.

Using the 2012 Programme for the International Assessment of Adult Competencies (PIAAC), we explore differences in literacy and numeracy skills, and the economic returns to these skills, for Canadian immigrants and non-immigrants. The novelty of this research is disaggregating the sample into seven distinct immigrant groups (based on admission class) and second- and third-generation Canadians. Our results show that no immigrant group performs as well on literacy and numeracy tests compared to those born in Canada, but that young immigrants do outperform adult immigrants. Similar results are found for wages, our metric for success in the labour market. Of the immigrant subgroups, economic immigrants tend to have the highest test scores and hourly wages, with refugees having the lowest. The wage returns to these basic skills are economically significant across all quantiles. Finally, we find that the labour market rewards literacy or numeracy skills equally for immigrants and the Canadian-born.

Norris, A.N. (2019) 'Are We Really Colour-blind? The Normalisation of Mass Female Incarceration,' Race and justice, 9(4), 454–478.

The sharp rise in female incarceration rates in both the United States and New Zealand has received increased attention. Even more pressing are the racial disparities among imprisoned females. This exploratory case study examines 13 peer-reviewed articles published between 2005 and 2016 to understand the nature of colour-blind ideology in discussions of female imprisonment in New Zealand. Several themes emerged including the homogenisation of female prisoners. Apart from moderately linking vast

racial disparities between incarcerated White women and Indigenous women to ill-defined colonial practices, contemporary explanations for the substantial racial disparities receive little attention. This article concludes that the absence of a critical lens toward contemporary forms and experiences of racism undergirding the mass criminalisation of Indigenous people perpetuates a colour blindness that in turn works to normalise mass female incarceration. Even in attempts to be unbiased, the way race/ethnicity, gender, age, and class are discussed in academic research exploring female incarceration seems to reflect the influential nature of controlling images rather than critique them.

Núñez, R.E. (2017) 'Is There Really an Evolved Capacity for Number?', Trends in cognitive sciences, 21(6), 409–424.

Humans and other species have biologically endowed abilities for discriminating quantities. A widely accepted view sees such abilities as an evolved capacity specific for number and arithmetic. This view, however, is based on an implicit teleological rationale, builds on inaccurate conceptions of biological evolution, downplays human data from non-industrialized cultures, over interprets results from trained animals, and is enabled by loose terminology that facilitates teleological argumentation. A distinction between quantical (e.g., quantity discrimination) and numerical (exact, symbolic) cognition is needed: quantical cognition provides biologically evolved preconditions for numerical cognition but it does not scale up to number and arithmetic, which require cultural mediation. The argument has implications for debates about the origins of other special capacities – geometry, music, art, and language.

OECD (2021), *21st-Century Readers: Developing Literacy Skills in a Digital World*, PISA, OECD Publishing, Paris

In 2012, PISA asked 15-year-olds how much time they spent on the Internet. In 2018, PISA asked the same question. The data reveal that Internet use in that age group has rocketed by 66% – almost the equivalent to the average adult workweek across OECD countries (Box 1.1). The increasing share of Internet users worldwide is changing not only how people interact with others but also how they interact with texts. People now access information more through digital devices where they once did so in print or by talking to other people. The rise of digital technology means that people need to be more selective in what they read due to the vast quantities of information available at the click of a button.

OECD (2020), *Linking Indigenous Communities with Regional Development in Canada*, OECD Rural Policy Reviews, OECD Publishing, Paris.

Canada's Constitution Act (1982) recognises three Indigenous groups: Indians (now referred to as First Nations), Inuit, and Métis. Indigenous peoples make a vital contribution to the culture, heritage, and economic development of Canada. Despite improvements in Indigenous well-being in recent decades, significant gaps remain with the non-Indigenous population. This study focuses on four priority issues to maximise the potential of Indigenous economies in Canada. First, improving the quality of the statistical framework and the inclusion of Indigenous peoples in the governance of data. Second, measures to improve the fairness and transparency for how Indigenous peoples can secure land tenure and the use of tools and such as land use planning to use it to promote community economic development. Third, promoting entrepreneurship so Indigenous peoples can use assets and resources in ways that align with their objectives for development. Fourth, implementing an approach to governance that adapts policies to places, and empowers Indigenous institutions and communities.

OECD (2019) OECD Skills Studies The Survey of Adult Skills Reader's Companion, Third Edition, OECD Publishing: Paris.

This edition of the Reader's Companion accompanies Skills Matter: Additional Results from the Survey of Adult Skills that reports the results from the 39 countries and regions that participated in the 3 rounds of data collection in the first cycle of PIAAC, with a particular focus on the six countries that participated in the third round of the study (Ecuador, Hungary, Kazakhstan, Mexico, Peru and the United States). It describes the design and methodology of the survey and its relationship to other international assessments of young students and adults.

OECD (2018), *Indigenous Employment and Skills Strategies in Canada*, OECD Reviews on Local Job Creation, OECD Publishing, Paris,

Across many OECD countries, Indigenous People represent an important and growing demographic group with a unique set of cultures and customs. In a local development context, many Indigenous People are within remote areas and face unique challenges in finding quality employment and economic development opportunities. They often experience lower outcomes than the non-Indigenous population on a number of key economic and social indicators. Well-designed employment and skills policies are fundamental to link Indigenous People to high quality jobs, while also contributing to broader economic development objectives and inclusive growth. The OECD LEED Programme has built a large body of evidence on "what works" for disadvantaged groups, including Indigenous populations over the past 35 years. This work has demonstrated the importance of providing more autonomy to the local level to enable policy innovation. With regard to Indigenous People, this is critical in supporting the principle of self-determination.

OECD (2017-1), Promising Practices in Supporting Success for Indigenous Students, OECD Publishing, Paris, https://dx.doi.org/10.1787/9789264279421-en.

Indigenous peoples are diverse, within and across nations. However, Indigenous peoples have experienced colonisation processes that have undermined Indigenous young people's access to their identity, language and culture. At the same time, Indigenous children have not generally had access to the same quality of education that other children in their country have had access to. These two forces in combination have undermined the educational opportunities and outcomes of successive generations of Indigenous children and young people, at times with catastrophic effect. The six Canadian provinces and territories that participated in this study, along with New Zealand and Queensland (Australia), are actively seeking to better meet the educational needs and aspirations of Indigenous students and their families. The report seeks to identify promising strategies, policies, programmes and practices that support improved learning outcomes for Indigenous students and to build an empirical evidence base on Indigenous students in education. The study investigates four areas in Indigenous education: well-being, participation, engagement and achievement in education. These outcomes are inter-connected and mutually reinforcing, and each is essential for the success of every student.

OECD (2017-2). *Policies for Stronger and More Inclusive Growth in Canada: Better Policy Series,* Corrigenda, OECD Publishing, Paris

Canada has experienced solid improvements in living standards in the last two decades and enjoys a higher quality of life than many other OECD countries. GDP per capita is above the OECD average, and Canadians enjoy better environmental quality and better health outcomes than the average in OECD countries. Canada's employment rate is well above the OECD average, and Canada is also one of the strongest OECD countries in terms of students' skills. However, not all population groups enjoy equally high levels of well-being. Although Canada is one of the few OECD countries where inequality did not rise during the 2000s, inequalities in income and other dimensions of well-being remain higher than in the OECD countries with the lowest inequalities. This suggests that Canada can do even better. Incomes for the top 10% of the income distribution are, on average, nine times higher than for the bottom 10%, compared to five and six times higher in the best performing OECD countries. Moreover, even though the share of middle-income households has barely changed over the last 15 years, fewer and fewer Canadian households perceive themselves as belonging to the middle class

OECD and Statistics Canada (2000). *Literacy in the Information Age Final Report of the International Adult Literacy Survey* Organisation for Economic Co-operation and Development, Paris, and the Minister of Industry, Canada, 2000. Applications for

permission to reproduce or translate all or part of this material should be made to: Head of Publications Service, OECD, two rue André-Pascal, 75775 Paris Cedex 16, France.

The study offers an understanding of the nature and magnitude of literacy issues faced by countries and explores new insights into the factors that influence the development of adult skills in various settings – at home, at work and across countries. The twenty countries represented account for over 50 per cent of the world's entire gross domestic product. As such, the literacy data can contribute importantly to an understanding of the demand and supply of skills in the global, knowledge-based economy. The results confirm the importance of skills for the effective functioning of labour markets and for the economic success and social advancement of both individuals and societies. They offer policy makers a useful tool for policy analysis and for crafting policies and programmes that can contribute to economic and social progress.

Parmenter, J., Trigger, D. (2018) 'Aboriginal cultural awareness training for mine employees: Good intentions, complicated outcomes', The extractive industries and society, 5(2), 363–370.

In the Australian context, training for employees to impart 'cultural awareness' concerning Indigenous people has recently become a common feature of workplace inductions within the mining industry. The training aims to foster good relationships between companies and Aboriginal Traditional Owners of land and increase Aboriginal employment within the industry by educating miners about 'Aboriginal culture.' However, there have been few investigations focused on how the training is constructed, delivered, its content, or efficacy. This article presents an overview of how this training is being implemented at several major Rio Tinto Iron Ore (RTIO) mines in the Pilbara region of Western Australia. The study finds that the corporate sector's commitment to educating workers about cultural difference is difficult to achieve in this highly politicized setting. The paper argues for an understanding of the complexities and strategic politics involved in implementing Aboriginal cultural awareness training to avoid both naïve expectations and unintended negative consequences.

Park, J. (2018). Overqualification Among Aboriginal Workers in Canada. *The International Indigenous Policy Journal*, 9(1).

This study examines education, employment, and the extent to which adult Aboriginal workers (aged 25-64) were overqualified for their jobs compared to non-Aboriginal workers. Data are from the 2011 National Household Survey (NHS) including 415,115 Aboriginal workers and 13,301,610 non-Aboriginal workers. Aboriginal workers with higher levels of education (bachelor degree or higher) were less likely to be overqualified than their non-Aboriginal counterparts; but Aboriginal workers with lower levels of education (less than university level) were more likely to be overqualified than

non-Aboriginal workers. This study also highlights differences in over qualification by field of study: Among Aboriginal workers who earned university degrees, low over qualification rates were found among those who studied education; mathematics, computer, and information sciences; architecture, engineering, and related technologies; and health fields.

Passey, Don, et al. "Digital agency: Empowering equity in and through education." *Technology, Knowledge and Learning* 23.3 (2018): 425-439.

This theoretical paper is concerned with conceptualising a major issue that faces all those concerned with and charged with influencing the future of equity in education—the need for digital agency (DA). The paper offers a rationale for this concern, highlights the importance of the concept and its practices, presents the challenges it brings, some current ways in which practices are tackling these challenges, and considers the theoretical foundation for how it might be addressed further in the future. The paper defines DA, and its three component parts—digital competence, digital confidence, and digital accountability. The paper argues that DA is a fundamental requirement for and through education, that it affects all citizens in a global society, and should be enabled through their ongoing and developing digital practices. The paper concludes with recommendations for different educational groups - including policy makers, practitioners, developers, and researchers.

Pearson, C.A., Daff, S. (2013) 'Transcending hunter gatherer pursuits while balancing customary cultural ideals with market forces of advanced western societies: Extending the traditional boundaries of Indigenous Yolngu people of the Northern Territory of Australia', International journal of cultural studies, 16(2), 189–208.

As large multinationals move their operations into remote regions of the world, imperatives of social responsibility and sound business pragmatism compel engagement of the marginalized local Indigenous people. This notion is particularly relevant for the mining industry in Australia, which is undertaken in remote regions, where the local Indigenous communities are significantly socio-economically disadvantaged compared to other Australians. This article reports the job-related outcomes of Indigenous Yolngu people of East Arnhem Land in the Northern Territory of Australia who were participants in a unique vocational-educational programme set up by the multinational mining company Rio Tinto Alcan. These mainline job-related outcomes are in two main areas: (1) employment in mainline work at the Nhulunbuy refinery or the mine site and (2) entrepreneurial timber-related business (milling timber, house construction, and furniture manufacture). Both streams are inaugural achievements for these Indigenous Australians. The concluding sections present challenges for multinational corporations when anchoring institutional processes, structures and the

contemporary technologies of the workplace with the contextuality of rural Australian communities.

Pena, A. A. (2016). PIAAC skills and economic inequality. *Journal of Research and Practice for Adult Literacy, Secondary, and Basic Education*, *5*(2), 17-34.

Mixed findings characterize the literature on skills and economic distributions within and across countries. The Programme for the International Assessment of Adult Competencies (PIAAC) offers new, internationally comparable data on literacy, numeracy, and digital problem-solving skills that can be combined with wage information. This paper presents statistical analyses, aimed at quantifying the contributions of observable and unobservable contributors to earnings inequality. Substantial inequality is documented across countries and skill measures, thus reinforcing previous findings that skill, even by the broader definition used here, is only a partial explanation for differences in economic inequality across countries. The paper concludes with future research possibilities that can further understandings of inequality dynamics within and across nations. [The original version of this paper was commissioned by American Institutes for Research (AIR), funded through a contract with the National Center for Education Statistics (NCES).]

Perry, K.H., Shaw, D.M., Saberimoghaddam, S. (2020) 'Literacy practices and the Programme for the International Assessment of Adult Competencies (PIAAC): A conceptual critique', International review of education, 66(1), 9–28.

The Programme for the International Assessment of Adult Competencies (PIAAC) assesses key skills in literacy, numeracy and problem-solving in technology-rich environments, as well as their relationship to other social outcomes for adults. PIAAC's developers claimed to better account for adults' literacy practices than earlier international studies such as the International Assessment of Literacy Study (IALS). Through the sociocultural lens of literacy as social practice, the authors explore the tension between PIAAC's cognitive orientation and its attempt to factor in meaningful literacy practices. Specifically, they analyse PIAAC's conceptualization of literacy practices as instantiated in the background questionnaire given to adult participants. They conclude that PIAAC's conceptualization does not align well with current theoretical understandings of literacy practice, as evidenced by (1) its conflation of several key literacy terms, including text, genre and practice, and (2) its erasure of context, purpose and social interaction from literate practice. Thus, the authors found considerable room for improvement in the assessment of adults' actual literacy practices.

Preston, J.P., Cottrell, M., Pelletier, T.R., Pearce, J.V. (2012) 'Aboriginal early childhood education in Canada: Issues of context', Journal of early childhood research: ECR, 10(1), 3–18.

Herein we provide a literature synthesis pertaining to the state of Aboriginal early childhood education in Canada. We identify key features of quality Aboriginal early childhood programs. The background and significance of early childhood education for Aboriginal peoples is explicated. Cultural compatibility theory is employed as the philosophical basis to conceptualize quality Aboriginal early childhood education. Based on this theoretical premise, we suggest Aboriginal early childhood programs should incorporate Aboriginal pedagogy, be infused with Aboriginal language and culture, be adequately staffed by qualified Aboriginal educators, be structured to empower Aboriginal communities and incorporate full-day kindergarten. Prominent Aboriginal early childhood programs are featured within the article.

Proulx, G., Beaudoin, J.-M., Asselin, H., Bouthillier, L., Théberge, D. (2020) 'Untapped potential? Attitudes and behaviours of forestry employers toward the Indigenous workforce in Quebec, Canada,' Canadian journal of forest research, 50(4), 413–421.

The skilled labour shortage in the natural resource sector is a major issue in North America, particularly in the Canadian forestry sector. In the province of Quebec alone, 15 000 positions will need to be filled by 2022. At the same time, many Indigenous communities are seeking to develop employment opportunities, as they have high unemployment rates and a young and growing population. But are forestry employers creating an environment conducive to the recruitment, integration, and retention of an Indigenous workforce? We interviewed 22 directors and human resource managers from 19 forestry businesses (16 non-Indigenous and 3 Indigenous) in Quebec, with a view to answering this question. Employer narratives suggest that they have only just begun to see the potential of the Indigenous workforce and put in place diversity management practices. Partnerships between Indigenous communities and forestry businesses, development of alternative training and skill development methods, and awareness-raising among employees and employers were found to favour recruitment, integration, and retention of Indigenous workers. Conversely, according to participants, stereotypes, discrimination, lack of inclusion measures, drug and alcohol use, and lack of training reduce the potential for Indigenous people to join the forestry workforce.

Pullman, Ashley, & Michelle Y. Chen (2020). Varieties of employment: a comparison of skill-based activities at work among youth and young adults in Canada, International Journal of Lifelong Education, 39:5-6, 576-590.

Using skill and earnings data from the OECD's newly released Programme for the International Assessment of Adult Competencies (PIAAC) and decomposition

methodology from literature on economic distributions across countries, this research provides new evidence about the limited extent to which levels of and rates of return to skills explain unequal wage distributions in subgroups defined by race and ethnicity in the United States. The specific importance of PIAAC skill levels and of rates of return to skill varies substantially between racial and ethnic minorities relative to Whites and across the upper and lower parts of the wage distribution, while unobservables remain critical. These findings about differential characteristics of wage spreads are in contrast to relatively high correlations between the means of wage distributions and the more comprehensively defined skill measures observed in PIAAC (in comparison to those that have been examined in past literature) and are robust to the inclusion of other observable human capital and socioeconomic determinants. Results have implications for understanding how formal and informal institutions, discrimination, and labor market compensation practices may translate differentially across racial and ethnic groups and into observed variation in earnings.

Rappleye, Jeremy & Hikaru Komatsu (2021). Is knowledge capital theory degenerate? PIAAC, PISA, and economic growth, *Compare: A Journal of Comparative and International Education*, 51:2, 240-258.

Extending recent analyses using PISA data, the current study utilises the OECD's Survey of Adult Skills (PIAAC) to test the central claims of knowledge capital theory. PIAAC has a distinct advantage over PISA in that it more directly tests levels of purported 'knowledge capital' across an entire national workforce, rather than offering approximations based on the performance of 15-year-old students. Findings from our two original studies reported herein further refute the tight linkage between cognitive levels and GDP growth per capita envisaged by proponents of knowledge capital, most notably the OECD and World Bank. These results suggest that knowledge capital theory is now degenerate. If scholars are willing to extend this reporting of results refuting knowledge capital theory, this will likely accelerate the theory's loss of momentum in the coming years.

Ratcliffe, Ruth, and Bob Boughton. "The Relationship Between Low Adult Literacy Levels and Aboriginal Family and Community Engagement in Educational Decision Making." *Australian and International Journal of Rural Education*, vol. 29, no. 1, Jan. 2019, pp. 1+.

This article draws on work with communities in the rural and remote towns of Brewarrina, Wilcannia and Enngonia, New South Wales (NSW) to explore the relationship between low adult literacy levels and the continuing alienation of Aboriginal communities from educational decision making. Building on the analysis of community/school relations conducted by scholars such as Chris Sarra, Jay Phillips, Allan Luke, and Kevin Lowe, we contend that addressing the problem of low adult

literacy is necessary to improve relationships between communities and schools in widespread and sustainable ways. Communities who have participated in the Yes, I Can! Aboriginal Adult Literacy Campaign help us to understand a number of important issues, including, the extent of disenfranchisement that is associated with inadequate adult literacy, the enormity of the challenges faced by previously low-literate and disengaged people to re-engage in community life, the additional pressures placed on literate members of the community when many people have minimal literacy, and the relationship between low rates of adult literacy and the persistence of deficit thinking on the part of schools.

Reiter, C. (2022) 'Changes in Literacy Skills as Cohorts Age', Population and development review, 48(1), 217–246.

As our societies transform into knowledge societies, skills are playing an ever-increasing role in life. Despite recent efforts to consistently measure adult skills across countries, a challenge remains to understand how skills evolve over time and what the main drivers behind these changes are. By applying demographic methods to estimate the development of skills over the life course, this paper presents the reconstruction of empirical adult literacy test results along cohort lines by age, sex, and educational attainment for forty-four countries for the period 1970–2015. Results suggest significant heterogeneity in the pattern of changes in literacy skills with age, reflecting the differential exposure to cognitive stimulation over the life course and suggesting that the development of skills in a country is also the consequence of a changing composition of its population. Gender, however, was found to have hardly any effect on how literacy skills evolve between the ages of 15 and 65. On the aggregate level, findings reveal considerable differences between countries—regarding both the level of skills and their development over time. Overall, it was found that massive educational expansions happening globally in the recent past only partly resulted in a corresponding rise in skills.

Rempel, E., Lorie Donelle & Anita Kothari (2016). Exploring the health literacy of First Nations young adult women, Journal of Communication in Healthcare, 9:1, 11-21.

Relative to non-First Nations, Inuit, and Métis (FNIM) Canadians, FNIM people have poorer health status. Accessing and comprehending information and services that influence health is a fundamental skill that enables individuals to function within a health care system that expects individuals to play an active role in promoting their health. A qualitative investigation of the health literacy skills and the health information needs of young FNIM adults was conducted. Eight single First Nation mothers living On-Reserve were interviewed between February 2012 and September 2012. Data analysis generated main themes and subthemes of: (1) Health Information Needs of First Nations Young mothers; (2) Interpersonal Health Information Resources: (i) Asking the

Doctor/Telehealth, (ii) Female Family and Friends; and (3) Online Accessibility and User Skills: (i) Health Information Online, (ii) Social Media, and (iii) Navigation and Computer Skills. Although participants used online and social media resources to access health information, they expressed a lack of confidence in their ability to comprehend accessed information. Strategies to support First Nations young mothers are recommended.

Renbarger, R., Rivera, G., Sulak, T. (2019) 'What predicts literacy, numeracy, and problem solving for incarcerated individuals? A PIAAC examination,' Journal of offender rehabilitation, 58(3), 199–219.

The purpose of this article was to investigate relationships between literacy, numeracy, and problem-solving ability with characteristics of individuals within the United States prison system. The Programme for the International Assessment of Adult Competencies (PIAAC) dataset was used for analysis, which included information for 1,319 participants ages 16–74. Results indicated that offenders' prior experiences and prison context variables differentially predicted literacy, numeracy, and problem solving in technology-rich environments. Implications for prison education are discussed along with study limitations.

Rheault, H., Coyer, F., Jones, L. *et al.* Health literacy in Indigenous people with chronic disease living in remote Australia. *BMC Health Serv Res* **19,** 523 (2019).

Health literacy is strongly associated with health outcomes and is important for health policy and service delivery. Low health literacy was reported in 59% of Australian adults, however, there is no national data on the health literacy of Aboriginal and Torres Strait Islander (ATSI) peoples. The ATSI population in Australia experience a notable gap in health outcomes compared with non-Indigenous Australians which is due, in part to a higher prevalence of chronic diseases. The health outcome gap is more pronounced in rural and remote locations. This study aims to establish the health literacy profile of ATSI adults with chronic disease living in remote North-West Queensland Australia, and to investigate associations between the Health Literacy Questionnaire (HLQ) domains and self-reported chronic disease and demographic characteristics.

Richards, J. (2020). Student Performance in PISA 2018: Nettlesome Questions for Canada. Commentary - C.D. Howe Institute, (576), COV.

Indigenous/non-Indigenous education outcome gaps are large – albeit the evidence is fragmentary. Six of the ten provinces agreed to add a voluntary question inviting Indigenous students to self-identify. The agency responsible for administering the Canadian PISA sample decided not to release the Indigenous results, claiming they were "not representative." Without explanation, it is hard to know what "not representative" means. The decision to withhold results flouts the fundamental rationale

for conduct of PISA surveys, namely providing a better empirical foundation for discussion of education policy.

Ross, M. (2019). The Indigenous—White Earnings Gap and Labour Market Discrimination in Canada. (Master of Development Economics at Dalhousie University).

Indigenous people represent four percent of the total population in Canada and are the youngest and fastest growing minority population in the country. Colonialism left Indigenous people disadvantaged in terms of education, health, and labour market outcomes relative to the majority population in Canada today. This study looks at the relationship between self-reported labour market discrimination and the annual earnings gap between the Indigenous and white populations as of 2013 using Cycle 28 of the General Social Survey on Victimization in Canada. By employing the Oaxaca (1973) decomposition method, I find between 44.2 and 49.2 percent of the men's Indigenous– white annual earnings gap can be explained by observable characteristics and 50.8 and 55.8 percent of the gap is unexplained. For women, 32.2 percent of the gap cannot be explained when secondary variables such as employment type and disability status are included in that analysis, yet 86.3 percent is unexplained when only education, work experience and geography are observed. Lastly, I utilize a nuanced approach to analyzing the Indigenous– white earnings gap. A higher proportion of men reported labour market discrimination who have higher predicted earnings than their actual using human capital coefficients from the white group's earnings regression to predict Indigenous men's earnings.

Saxinger, G., and S. Gartler. 2017. The Mobile Workers Guide. Fly-in/Fly-out and Rotational Shift Work in Mining. Yukon Experiences. Whitehorse: ReSDA, First Nation of Na-Cho Nyäk Dun, Yukon College.

The "Mobile Workers Guide – Fly-in/Fly-out and Rotational Shift Work in Mining. Yukon Experiences" presents a wide range of insights into a work life that is characterised by mobility, living in camps and being on scheduled times away from home. In it, experienced workers – men and women alike – from a variety of professions in the exploration and mining sector provide insight for those who are new to this industry. They share stories, experiences, and strategies for coping with potential difficulties and tips for how to benefit from this traveling lifestyle. The sections of the guide introduce the readers to topics, such as, coping with boom-and-bust cycles, specifics of mining communities, First Nation employment, women in mining, family life and private relationships, income management and career development.

St. Clair, Ralf (2016). *Plus ça change* – The failure of PIAAC to drive evidence-based policy in Canada, *ZfW* 39:225–239.

The author discusses the influence of the Program for the International Assessment of Adult Competencies (PIAAC) on the literacy education field in Canada. Methodology is holistic and centered around critical policy analysis. Finds Canada invested heavily in the surveys and has not yet changed policy or practice in response to the findings. Two reasons for lack of influence are suggested: the difficulty of comparing literacy survey results over time, and the lack of federal investment in the organisations capable of putting the results into practice. Concludes with suggestions for bringing PIAAC and practice closer together.

Schirle, T., & Sogaolu, M. (2020). A work in progress: Measuring wage gaps for women and minorities in the Canadian labour market. *CD Howe Institute Commentary*, *561*.

A wide range of federal and provincial legislation is intended to ensure every Canadian has an equal opportunity to participate in and benefit from work in the Canadian labour market. Despite this, we invariably see evidence of large labour market disparities between different groups of individuals. In this Commentary, we describe the wage gaps that persist among groups working full-time in the private sector: between men and women, between individuals who are white, Indigenous, and members of visible minority groups, and between non-Indigenous individuals who were born in Canada and those who were not.

Schleicher, A. (2019). PISA 2018: Insights and Interpretations. *OECD Publishing*.

Equipping citizens with the knowledge and skills necessary to achieve their full potential, to contribute to an increasingly interconnected world, and to convert better skills into better lives needs to become a more central preoccupation of policy makers around the world. Fairness, integrity, and inclusiveness in public policy thus all hinge on the skills of citizens. In working to achieve these goals, more and more countries are looking beyond their own borders for evidence of the most successful and efficient education policies and practices. PISA is not only the world's most comprehensive and reliable indicator of students' capabilities, but also a powerful tool that countries and economies can use to fine-tune their education policies…That is why the OECD produces this triennial report on the state of education around the globe: to share evidence of the best policies and practices, and to offer our timely and targeted support to help countries provide the best education possible for all of their students.

Schleicher, A., Zimmer, K., Evans, J., & Clements, N. (2009). PISA 2009 Assessment Framework: Key Competencies in Reading, Mathematics and Science. *OECD Publishing (NJ1)*.

This publication presents the guiding principles of the PISA 2009 assessment, which are described in terms of the skills students need to acquire, the processes that need to

be performed and the contexts in which knowledge and skills are applied. Further, it illustrates the assessment domains with a range of sample tasks.

Also see: https://www.oecd.org/skills/piaac/
60-minute ppt lecture by Schleicher

Schleicher, A. (2008) PIAAC: A New Strategy for Assessing Adult Competencies. *Int Rev Educ* 54, 627–65.

At a time when governments face the challenges of maintaining competitiveness in a global economy, it is necessary to have high-quality comparative information regarding the fundamental skills of the adult population. Such information can help governments to evaluate policies and design more effective interventions. This article describes a strategy currently being developed by the OECD for assessing the literacy skills of adults, including familiarity with information and communication technologies and the ability to manage information, construct new knowledge and communicate with others. The work will enhance understanding of the effectiveness of education and training systems in developing basic cognitive skills and key generic work skills.

Schwerdt, G., Wiederhold, S., and Murray, T.S. (2020). Literacy and Growth: New Evidence from PIAAC. Retrieved [insert date] from PIAAC Gateway website: [insert link]. Washington, DC.

Expanded international data from the PIAAC survey of adult skills allow us to replicate the IALS based analysis by Coulombe, Tremblay and Marchand (2004) as well as Coulombe and Tremblay (2006) based on more recent and more comprehensive data on the literacy skills of the adult population. Results from panel estimations over the period 1970-2010 suggest that literacy skills have become an even more important determinant of economic growth than was suggested by the IALS analysis covering the period 1960-1995. Our estimates imply long-run elasticities of GDP per capita with respect to literacy of about 3. This means that in the long run a one-percent increase in literacy translates into a three-percent increase in GDP per capita. Short-run elasticities are also substantial. The association between labor productivity and literacy is equally strong. This suggests that the effect of literacy on living standards goes beyond its effect on unemployment and participation rates A closer inspection of the data additionally reveals some important heterogeneities: Investment in the human capital of women appears to have a much stronger effect on subsequent growth than investment in the human capital of men. Our results also suggest that underinvestment in human capital hampers growth by more than developing highly talented individuals stimulates it. Specifically, the proportion of adults with low levels of literacy skill – Levels 1 and 2 – appears to have a much larger impact on growth rates than the proportion of adults with Level 4 and 5 literacy proficiency. Thus, policies that serve to reduce the proportion of

low skilled adults would likely yield higher returns than those that serve to increase the proportion of high skilled adults.

Selle P. and Wilson GN. (2022) Economy, territory, and identity: A Rokkanian analysis of Indigenous self-determination in Canada and Norway. *Polar Record* 58(e3): 1–12.

Indigenous peoples throughout the circumpolar north have made significant progress in terms of securing self-determination through greater political autonomy. Although such change is important, it must be accompanied by greater economic control aimed at reducing state dependencies. Using an analytical framework developed by Norwegian political scientist, Stein Rokkan, this article explores the interplay between economy, territory, and identity among the Inuit in Canada and the Sámi in Norway. It reveals that the economic destinies of both groups have been profoundly influenced by both domestic and international factors that determine the focus and type of economic development they undertake. While the Inuit have pursued a balance of modern and traditional forms of economic development that is grounded in a regionally based model of self-rule, the Sámi have opted for an economic development model that emphasises traditional economic activities and is supported by Norway's international commitments to the rights of Indigenous peoples.

Shalley, F., & Stewart, A. (2017). *Aboriginal adult English language literacy and numeracy in the Northern Territory: A statistical overview*. Charles Darwin University.

The Whole of Community Engagement (WCE) initiative received a clear message when working closely with Aboriginal leaders, six remote NT communities, and other stakeholders over the past three years. Being able to speak, read, write, learn, and communicate in English and to apply these skills in life is viewed as essential by those Aboriginal adults who have educational aspirations for themselves, their family and community. From the broad consultation processes associated with the initiative we know that there is much work to be done in relation to English LLN policy and provision for Aboriginal people in the NT.

Skudra, M., Avgerinos, A., & McCallum, K. E. (2020). Mapping the landscape: Indigenous skills training and jobs in Canada. Public Policy Forum.

Between 2016 and 2026, 350,000 Indigenous youth will turn 15, the age at which they become potential members of the workforce. However, for many reasons including chronic under-funding of quality On-Reserve education, the challenge of acquiring reliable internet in remote conditions, and the myriad corollary effects of growing up in households disproportionately impacted by poverty and residential school syndrome, many Indigenous youth and adults do not graduate high school or graduate without requisite essential literacy and numeracy skills. This paper looks at current trends in

Canada and at the current state of knowledge. It does not offer policy advice or analysis; rather, its goal is to set out some facts to inform future conversations and to highlight what we know, what we do not and what we think might be important to know about skills and training for Indigenous peoples in Canada. In that spirit, the paper begins with an environmental scan of Indigenous peoples in Canada, collating knowledge about the context for Indigenous skills and outlining the relationship between Indigenous peoples and the Crown/state. It then expands into a review of the known demographics of Indigenous populations, and then move into a review of Indigenous future-of-work and skills-training arenas. We summarize our findings and suggest areas for future research in our sections on uncertainty and questions for future research. In inviting the reader to deeply consider the context of the Indigenous skills ecosystem, we aim to promote collective and collaborative solutions that will complement the efforts already being made by Indigenous business operators, service providers and workers to improve their skillsets and prepare for the future of work.

Smidova, Zuzana, Jarmila Botev, David Turner, Balázs Égert (2019) A New Macroeconomic Measure of Human Capital with Strong Empirical Links to Productivity, OECD Publishing.

This paper calculates new measures of human capital. Contrary to the existing literature, they are based on realistic rates of return to education, which are allowed to vary substantially across countries and to some extent over time. The new measures perform well in regression analysis explaining productivity across OECD countries and over time. In OECD samples, coefficient estimates are broadly consistent with the private returns underlying the construction of the new measures of human capital. In a wider sample of countries, most estimates imply additional positive social returns.

Stasiulis, D. (2020). Elimi (Nation): Canada's "Post-Settler" Embrace of Disposable Migrant Labour. *Studies in Social Justice*, *2020*(14), 22-54.

This article utilizes the lens of disposability to explore recent conditions of low-wage temporary migrant labour, whose numbers and economic sectors have expanded in the 21st century. A central argument is that disposability is a discursive and material relation of power that creates and reproduces invidious distinctions between the value of "legitimate" Canadian settler-citizens (and candidates for citizenship) and the lack of worth of undesirable migrant populations working in Canada, often for protracted periods of time. The analytical lens of migrant disposability draws upon theorizing within Marxian, critical modernity studies, and decolonizing settler colonial frameworks. This article explores the technologies of disposability that lay waste to low wage workers in sites such as immigration law and provincial/territorial employment legislation, the workplace, transport, living conditions, access to health care and the practice of medical

repatriation of injured and ill migrant workers. The mounting evidence that disposability is immanent within low-wage migrant labour schemes in Canada has implications for migrant social justice. The failure to protect migrant workers from a vast array of harms reflects the historical foundations of Canada's contemporary migrant worker schemes in an "inherited background field [of settler colonialism] within which market, racist, patriarchal, and state relations converge" (Coulthard, 2014, p. 14). Incremental liberal reform has made little headway insofar as the administration and in some cases reversal of more progressive reforms such as guaranteed pathways to citizenship prioritize employers' labour interests and the lives and health of primarily white, middle class Canadian citizens at the expense of a shunned and racialized but growing population of migrants from the global South. Transformational change and social justice for migrant workers can only occur by reversing the disposability and hyper-commodification intrinsic to low-wage migrant programs and granting full permanent legal status to migrant workers.

Statistics Canada, 2017 Aboriginal People's Survey *Labour Market Experiences of Métis: Key findings from the 2017 Aboriginal Peoples Survey,* Catalogue number 89-653-X2018002

The 2017 Aboriginal Peoples Survey (APS) marks the fifth cycle of this national survey of Métis, Inuit, and First Nations people living Off-Reserve, aged 15 years or older. In 2017, the survey focused on participation in the economy. The APS provides data on a wide range of topics including labour, education, language, housing, and health to inform policy and programming activities aimed at improving the well-being of First Nations people living Off-Reserve, Métis, and Inuit. It is a valuable source of information for Indigenous organizations, communities, service providers, researchers, governments, and the general public. The following are findings for people who self-identified as Métis**.** Also available are *Labour Market Experiences of Inuit: Key results from the 2017 Aboriginal Peoples Survey* (Catalogue no. 89-653-x2018004) and *Labour Market Experiences of First Nations people living Off-Reserve: Key results from the 2017 Aboriginal Peoples Survey* (Catalogue no. 89-653-x2018003).

Statistics Canada, 2017 Aboriginal People's Survey *Labour Market Experiences of First Nations people living Off-Reserve: Key findings from the 2017 Aboriginal Peoples Survey,* Catalogue number 89-653-X2018003

The 2017 Aboriginal Peoples Survey (APS) marks the fifth cycle of this national survey of First Nations people living Off-Reserve, Métis and Inuit aged 15 or older. In 2017, the survey focused on participation in the economy. The APS provides data on a wide range of topics including labour, education, language, housing, and health to inform policy and programming activities aimed at improving the well-being of First Nations people living Off-Reserve, Métis, and Inuit. It is a valuable source of information for

Indigenous organizations, communities, service providers, researchers, governments, and the general public. The following are findings for people who self-identified as First Nations people and were living Off-Reserve. Also available are *Labour Market Experiences of Métis: Key results from the 2017 Aboriginal Peoples Survey* (Catalogue no. 89-653-x2018002) and *Labour Market Experiences of Inuit: Key results from the 2017 Aboriginal Peoples Survey* (Catalogue no. 89-653-x2018004).

Statistics Canada (2013). *Skills in Canada: First Results from the Programme for the International Assessment of Adult Competencies (PIAAC)* Tourism and the Centre for Education Statistics Division Main Building, Room 2001, Ottawa, K1A 0T6 Catalogue no. 89-555-X ISBN 978-1-100-22678-1.

This report presents the first Canadian results of the Programme for the International Assessment of Adult Competencies (PIAAC), an initiative of OECD. PIAAC provides internationally comparable measures of three skills that are essential to processing information: literacy, numeracy, and problem-solving in technology-rich environments (referred to as PS-TRE). Canada is one of 24 countries and sub-national regions participating in this initiative. A sample of over 27,000 respondents was collected and allows reliable estimation at the national, provincial, and territorial level. The report provides information about the literacy, numeracy and PS-TRE skills for the Canadian population aged 16 to 65. It provides results for Canada as a whole, as well as for all the provinces and territories. In addition, it looks at the relationships between skills proficiency and a range of socio-demographic characteristics (e.g., age, gender, level of education) across the entire Canadian population. It also reports on first results on the literacy, numeracy and PS-TRE skills of Aboriginal populations, immigrants, and official-language minority communities.

Statistics Canada (2007). *International Adult Literacy Survey Adult Learning in Canada: A Comparative Perspective Results from the Adult Literacy and Life Skills Survey.* Kjell Rubenson, Richard Desjardins and Ee-Seul Yoon Statistics Canada Culture, Tourism, and the Centre for Education Statistics Division Main.

OECD's thematic review of adult learning policies and practices in 17 OECD countries found a growing recognition by policy makers of the necessity to invest in adult learning to achieve economic efficiency and address equity deficiencies (OECD, 2005a, p. 15). This trend is driven by advances in information and communication technologies, and reduced trade barriers. Industrial countries are undergoing a period of fundamental economic transformation in which knowledge and information is being promoted as the foundations for economic activity. In Canada, the recently released Plan for Growth and Prosperity notes that brainpower has become the fundamental basis of competitive advantage. "Knowledge and creativity have become the true measures of economic potential" (Government of Canada, 2005, p. 8).

Stijepic, D. (2021). A cross-country study of skills and unemployment flows. *Journal for Labour Market Research*, *55*(1), 1-30.

Using an international survey that directly assesses the cognitive skills of the adult population, I study the relation between skills and unemployment flows across 37 countries. Depending on the specifically assessed domain, I document that skills have an unconditional correlation with the log-risk-ratio of exiting to entering unemployment of 0.65–0.68 across the advanced and skill-abundant countries in the sample. The relation is remarkably robust, and it is unlikely to be due to reverse causality. I do not find evidence that this positive relation extends to the seven relatively less advanced and less skill-abundant countries in the sample: Peru, Ecuador, Indonesia, Mexico, Chile, Turkey, and Kazakhstan.

Taylor, J., Kukutai, T. (2016*) Indigenous Data Sovereignty: Toward an Agenda*, Australian National University Press: Acton, A.C.T.

The emergence of the global data revolution and associated new technologies can be a double-edged sword for Indigenous peoples. This collection of essays reviews the concept of data sovereignty and the right of Indigenous people to maintain, control, protect and develop their cultural heritage, traditional knowledge and traditional cultural expressions, as well as their right to their intellectual property over data.

Tess Miller (2018). Measures of Indigenous achievement in Canada, *Diaspora, Indigenous, and Minority Education*, 12:4, 182-200.

In Canada, the immigration selection process gives great importance to education level. However, studies find that given an equivalent level of education, immigrants have significantly lower literacy skills than their Canadian-born counterparts. This research shows the importance of accounting for literacy skills in the analysis of labor supplies. Made possible by survey data from the Programme for the International Assessment of Adult Competencies (PIAAC) and a microsimulation model (LSD-C), the Canadian workforce (labor supply) is projected by many socio-economic variables, including literacy skill proficiency. The projected workforce is then distinguished according to the five major occupational types as defined by the National Occupational Classification (NOC) of Canada. The parameters used for this distribution derive from multinomial logistic regressions stratified by education level and immigration status. These regressions first account for a slew of socio-demographic variables including level of literacy ($N = 15,180$). The procedure is then repeated omitting literacy. A comparison of the two breakdowns shows that by factoring literacy skills into the analysis, the projected supply of labor (and skills) is more conservative. In analyzing this refined reflection of labor force supply, we show how it is more balanced and how it better

matches the labor demand. This paper highlights how traditional projections and analyses of labor supply and demand, which only account for education level, overestimate the number of workers who have a proper skillset for holding professional or managerial positions. Policy implications in terms of immigrants' selection and economic integration are discussed.

The National Aboriginal Economic Development Board (2016) *Reconciliation: Growing Canada's Economy by $27.7 Billion Background and Methods Paper,* Gatineau, (Quebec) The National Aboriginal Economic Development Board www.naedb-cndea.com

The Indigenous labour force is underutilized as illustrated by the significant gaps in economic indicators between Indigenous people and non-Indigenous Canadians. This study focuses on the need to for a strategy to raise the productivity of the Indigenous labour force given the country's rising senior dependency ratio. In contrast to the Canadian population, the Indigenous population is young and growing fast. In 2011, 46% of the Indigenous population was under age 25 compared with 29% for the non-Indigenous population. The median age of the Indigenous population was 28 compared with 41 for the non-Indigenous population in 2011.7 The number of working age (25 to 64) Indigenous people increased 21% between 2006 and 2011 compared with only 5% growth among the non-Indigenous population.

Thomas, A., Bohr, Y., Hankey, J., Oskalns, M., Barnhardt, J., Singoorie, C. (2022) 'How did Nunavummiut youth cope during the COVID-19 pandemic? A qualitative exploration of the resilience of Inuit youth leaders involved in the I-SPARX project,' International journal of circumpolar health, 81(1), 2043577–2043577.

This study investigated how COVID-19 has affected the wellness of a group of Inuit youth leaders in Nunavut in the context of their involvement with an ongoing mental health research initiative, the Making I-SPARX Fly in Nunavut [I-SPARX] project. The study had three goals: (1) to understand how the pandemic has affected I-SPARX leaders' perceived involvement in the I-SPARX Project; (2) to build knowledge around how the pandemic has impacted the daily life and wellbeing of youth in Nunavummiut communities; and (3) to acquire a culturally specific understanding of their coping mechanisms and resilience strategies through the lens of Inuit Qaujimajatuqangit (IQ). Nine Inuit youth were interviewed virtually about their participation in I-SPARX, their life during the pandemic, and their coping strategies. Their comments were analysed using inductive thematic analysis. Pandemic challenges, the utility of I-SPARX teachings and participation, and culturally and community-embedded pathways to resilience were discussed. The implications of COVID-19 on Inuit youth in remote communities are not fully understood. The current study illuminates their experiences of the pandemic to inform future research on ways in which Inuit youth might be supported in situations,

such as a global pandemic, that restrict their traditional resilience-enhancing activities and create social isolation

Trovato, Frank et al. "Economic Conditions of Indigenous Peoples in Canada". *The Canadian Encyclopedia*, 06 May 2022, *Historica Canada*, with update by Laura Aylsworth, Michelle Filice, June 15, 2022. www.thecanadianencyclopedia.ca/en/article/aboriginal-people-economic-conditions. Accessed 29 June 2022.

No abstract.

Vézina, Samuel and Alain Bélanger (2020). Literacy Skills as an Explanation for Labor Market Imbalances by Occupational Type in Canada: Microsimulation Projections for 2014–2024, *Population Research and Policy Review* 39:1019–1049.

In Canada, the immigration selection process gives great importance to education level. However, studies find that given an equivalent level of education, immigrants have significantly lower literacy skills than their Canadian-born counterparts. This research shows the importance of accounting for literacy skills in the analysis of labor supplies. Made possible by survey data from the Programme for the International Assessment of Adult Competencies (PIAAC) and a microsimulation model (LSD-C), the Canadian workforce (labor supply) is projected by many socio-economic variables, including literacy skill proficiency. The projected workforce is then distinguished according to the five major occupational types as defined by the National Occupational Classification (NOC) of Canada. The parameters used for this distribution derive from multinomial logistic regressions stratified by education level and immigration status. These regressions first account for a slew of socio-demographic variables including level of literacy (N = 15,180). The procedure is then repeated omitting literacy. A comparison of the two breakdowns shows that by factoring literacy skills into the analysis, the projected supply of labor (and skills) is more conservative. In analyzing this refined reflection of labor force supply, we show how it is more balanced and how it better matches the labor demand. This paper highlights how traditional projections and analyses of labor supply and demand, which only account for education level, overestimate the number of workers who have a proper skillset for holding professional or managerial positions. Policy implications in terms of immigrants' selection and economic integration are discussed.

Vézina, Samuel, Alain Bélanger, Patrick Sabourin, and Guillaume Marois. (2019). "Literacy Skills of the Future Canadian Working-Age Population: Assessing the Skill Gap Between the Foreign- and Canadian-Born." Canadian Studies in Population 46 (1): 5-25.

This paper presents the results of literacy proficiency projections using a microsimulation model that simultaneously projects future demographic, ethnocultural, and socioeconomic characteristics of the Canadian population. Factors linked with literacy skills of the working-age population are analyzed for both native- and foreign-born Canadians. The projection results show that literacy skills are likely to slightly decline between 2011 and 2061, as the positive effects of increasing education are canceled out by the important skill gap between native- and foreign-born Canadians. Results of the simulation suggest that plausible changes to immigrant selection policies could prevent against the associated literacy skill decline among the Canadian working-age population.

Veracini, L. (2008) 'Settler Collective, Founding Violence and Disavowal: The Settler Colonial Situation', *Journal of intercultural studies*, 29(4), 363–379.

This paper outlines a number of approaches to an analysis of settler colonial subjectivities, the exploration of a specific state of mind and the detection of a number of paranoiac dispositions in a particular set of political traditions. At the same time, this paper explores the possibility of a Lacanian (i.e., imaginary, symbolic, real) interpretation of what is here defined as the settler colonial situation. First there is an imaginary spectacle, an ordered community working hard and living peacefully Little House on the Prairie style. Then there is the symbolic and ideological background: a moral and regenerative world that supposedly epitomises settler democratic traditions (the 'frontier,' the 'outback,' the 'backblocks,' etc.). Finally, there is the real: expanding capitalist orders associated with the need to resettle a growing number of people. While this paper is aware that the categories of this analysis were initially developed in order to classify individual psychic phenomena and not collective processes and while it is suggestive rather than conclusive (and while it focuses on Australia's settler colonial condition), this paper is especially aimed at outlining the possibility for further research. It ultimately suggests that 'Settler Society' is in itself a fantasy emanating from a painful perception of growing contradictions and social strife, where the prospect of settler migration literally operates as a displacement of tension, and where the longing for a classless, stationary and settled body politic can find expression. This paper also suggests that an appraisal of the settler colonial situation can contribute to the interpretation of current contestations surrounding Indigenous difference in settler societies.

Walker, J. (2020). Comparing adult education systems: Canada and Aotearoa New Zealand. *ZfW* 43, 241–257.

This article examines recent policy initiatives in adult education and training in Canada and Aotearoa New Zealand in relation to political and educational reforms enacted over the previous decades. The paper attempts to deepen our understanding of adult

education systems—or lack thereof—in each place, and of neoliberalism, and responses to it.

Walter, M., Lovett, R., Maher, B., Williamson, B., Prehn, J., Bodkin-Andrews, G., Lee, V. (2021) 'Indigenous Data Sovereignty in the Era of Big Data and Open Data', The Australian journal of social issues, 56(2), 143–156.

Indigenous Data Sovereignty, in its proclamation of the right of Indigenous peoples to govern the collection, ownership, and application of data, recognises data as a cultural and economic asset. The impact of data is magnified by the emergence of Big Data and the associated impetus to open publicly held data (Open Data). Aboriginal and Torres Strait Islander peoples, families and communities, heavily overrepresented in social disadvantage–related data will also be overrepresented in the application of these new technologies, but in a data landscape, Indigenous peoples remain largely alienated from the use of data and its utilization within the channels of policy power. Existing data infrastructure, and the emerging Open Data infrastructure, neither recognize Indigenous agency and worldviews nor consider Indigenous data needs. This is demonstrated in the absence of any consideration of Indigenous data issues in Open Data discussions and publication. Thus, while the potential benefits of this data revolution are trumpeted, our marginalized social, cultural and political location suggests we will not share equally in these benefits. This paper discusses the unforeseen (and likely unseen) consequences of the influence of Open Data and Big Data and discusses how Indigenous Data Sovereignty can mediate risks while providing pathways to collective benefits.

Wannell Ted and Sheila Currie (2016). *Determinants of Participation in 2011 Indigenous Labour Market Programs: Final Report*, Social Research and Demonstration Corporation, Aboriginal Affairs Directorate Employment and Social Development Canada.

The purpose of this project is to provide background information for the renewal of the Aboriginal Skills and Employment Training Strategy within the broader scope of Employment and Social Development Canada's (ESDC) Indigenous Labour Market Programs. The research focuses on barriers to participation in Indigenous labour market programs (ILMP). The main categories of barriers included are health and social barriers, barriers related to community infrastructure, barriers related to housing, and the impacts of low economic activity and remoteness.

Wilk, P., Maltby, A. & Cooke, M. Residential schools and the effects on Indigenous health and well-being in Canada—a scoping review. *Public Health Rev* **38,** 8 (2017).

Background: The history of residential schools has been identified as having long lasting and intergenerational effects on the physical and mental well-being of Indigenous populations in Canada. Our objective was to identify the extent and range of research on residential school attendance on specific health outcomes and the populations affected. Methods: A scoping review of the empirical peer-reviewed literature was conducted, following the methodological framework of Arksey and O'Malley (2005). For this review, nine databases were used: Bibliography of Native North Americans, Canadian Health Research Collection, CINAHL, Google Scholar, Indigenous Studies Portal, PubMed, Scopus, Statistics Canada, and Web of Science. Citations that did not focus on health and residential school among a Canadian Indigenous population were excluded. Papers were coded using the following categories: Indigenous identity group, geography, age-sex, residential school attendance, and health status. Results: Sixty-one articles were selected for inclusion in the review. Most focused on the impacts of residential schooling among First Nations, but some included Métis and Inuit. Physical health outcomes linked to residential schooling included poorer general and self-rated health, increased rates of chronic and infectious diseases. Effects on mental and emotional well-being included mental distress, depression, addictive behaviours and substance misuse, stress, and suicidal behaviours. Conclusion: The empirical literature can be seen as further documenting the negative health effects of residential schooling, both among former residential school attendees and subsequent generations. Future empirical research should focus on developing a clearer understanding of the aetiology of these effects, and particularly on identifying the characteristics that lead people and communities to be resilient to them.

Zarifa, David, Brad Seward, Roger Pizarro Milian, (2019). Location, location, location: Examining the rural-urban skills gap in Canada. *Journal of Rural Studies* Vol 72: 252-263.

The elevated demands of the new knowledge economy pose particular challenges to rural and northern regions in Canada, long acknowledged by policymakers to suffer from acute human capital deficits. Rural residents obtain lower levels of education than their urban counterparts and those that do obtain post-secondary training often migrate to urban regions offering abundant employment opportunities and higher wages. Despite an emerging consensus around over skill deficits across rural regions, Canadian researchers have yet to systematically explore contemporary rural-urban differences in human capital using refined measures of literacy and numeracy skills. We ameliorate this deficiency by mapping rural-urban disparities in skills across the working age population (16–65) using Statistics Canada's 2012 Longitudinal International Study of Adults (LISA). Our results indicate that residents from smaller population centers and rural areas within Canada show significantly lower skills proficiencies. These differences across location of residence shrink considerably when controlling for education level, underscoring the need to enhance post-secondary access in rural areas.

5. Appendix 1: Statistics Canada Education Cross Tabs and Reports

The following are a sample of the 2016 Census of Canada output available from Statistics Canada which cover Aboriginal educational attainment, field of study, employment outcomes, and specialized fields of study (STEM) which appear to have been underutilized in educational and adult skills research reports, assessments, and the academic literature but which speak directly to the project.

Statistics Canada - 2016 Census. Aboriginal Identity (9), *Major Field of Study - Classification of Instructional Programs (CIP) 2016 (43), Highest Certificate, Diploma or Degree (15), Registered or Treaty Indian Status (3), Residence by Aboriginal Geography (10), Age (9) and Sex (3) for the Population Aged 15 Years and Over in Private Households of Canada, Provinces, and Territories, 2016 Census - 25%* Sample Data. Catalogue Number 98-400-X2016262.

Statistics Canada - 2016 Census. *Aboriginal Identity (9), Highest Certificate, Diploma or Degree (11), Income Statistics (17), Registered or Treaty Indian Status (3), Age (9) and Sex (3) for the Population Aged 15 Years and Over in Private Households of Canada, Provinces and Territories, Census Metropolitan Areas, and Census Agglomerations, 2016 Census - 25% Sample Data* Catalogue Number 98-400-X2016178.

Statistics Canada - 2016 Census. *Aboriginal Identity (9), Highest Certificate, Diploma or Degree (11), Income Statistics (17), Registered or Treaty Indian Status (3), Age (9) and Sex (3) for the Population Aged 15 Years and Over in Private Households of Canada, Provinces and Territories, Census Metropolitan Areas, and Census Agglomerations, 2016 Census - 25% Sample Data,* Catalogue Number 98-400-X2016178.

Statistics Canada - 2016 Census. *Aboriginal Identity (9), Highest Certificate, Diploma or Degree (11), Income Statistics (17), Registered or Treaty Indian Status (3), Age (9) and Sex (3) for the Population Aged 15 Years and Over in Private Households of Canada, Provinces and Territories, Census Metropolitan Areas, and Census Agglomerations, 2016 Census - 25% Sample Data*

Statistics Canada - 2016 Census. Catalogue Number 98-400-X2016178.

Statistics Canada - 2016 Census. *Aboriginal Identity (9), Highest Certificate, Diploma or Degree (15), Labour Force Status (8), Registered or Treaty Indian Status (3), Residence by Aboriginal Geography (10), Age (10) and Sex (3) for the Population Aged 15 Years and Over in Private Households of Canada, Provinces, and Territories, 2016 Census - 25% Sample Data.* Statistics Canada - 2016 Census. Catalogue Number 98-400-X2016266.

Statistics Canada - 2016 Census. *Aboriginal Identity (9), Highest Certificate, Diploma or Degree (15), Labour Force Status (8), Registered or Treaty Indian Status (3), Residence by Aboriginal Geography (10), Age (10) and Sex (3) for the Population Aged 15 Years and Over in Private Households of Canada, Provinces, and Territories, 2016 Census - 25% Sample Data.* Statistics Canada - 2016 Census. Catalogue Number 98-400-X2016266.

Statistics Canada - 2016 Census. *Aboriginal Identity (9), Employment Income Statistics (7), Highest Certificate, Diploma or Degree (11), Major Field of Study - Classification of Instructional Programs (CIP) 2016 (14), Work Activity During the Reference Year (3), Age (10) and Sex (3) for the Population Aged 15 Years and Over in Private Households of Canada, Provinces, and Territories, 2016 Census - 25% Sample Data – University certificate, diploma, or degree at bachelor level or above.* Statistics Canada - 2016 Census. Catalogue Number 98-400-X2016268.

Statistics Canada - 2016 Census. *Aboriginal Identity (9), Employment Income Statistics (7), Highest Certificate, Diploma or Degree (11), Major Field of Study - Classification of Instructional Programs (CIP) 2016 (14), Work Activity During the Reference Year (3), Age (10) and Sex (3) for the Population Aged 15 Years and Over in Private Households of Canada, Provinces, and Territories, 2016 Census - 25% Sample Data – Apprentices and Trades.* Statistics Canada - 2016 Census. Catalogue Number 98-400-X2016268.

Statistics Canada - 2016 Census. *Aboriginal Identity (9), Employment Income Statistics (7), Highest Certificate, Diploma or Degree (11), Major Field of Study - Classification of Instructional Programs (CIP) 2016 (14), Work Activity During the Reference Year (3), Age (10) and Sex (3) for the Population Aged 15 Years and Over in Private Households of Canada, Provinces, and Territories, 2016 Census - 25% Sample Data – No certificate, diploma, or degree* Statistics Canada - 2016 Census. Catalogue Number 98-400-X2016268.

Statistics Canada - 2016 Census. *Aboriginal Identity (9), Employment Income Statistics (7), Highest Certificate, Diploma or Degree (11), Major Field of Study - Classification of Instructional Programs (CIP) 2016 (14), Work Activity During the Reference Year (3), Age (10) and Sex (3) for the Population Aged 15 Years and Over in Private Households of Canada, Provinces, and Territories, 2016 Census - 25% Sample Data – Total.* Statistics Canada - 2016 Census. Catalogue Number 98-400-X2016268.

Statistics Canada - 2016 Census. *Aboriginal Identity (9), STEM and BHASE (non-STEM) Groupings, Major Field of Study - Classification of Instructional Programs (CIP) 2016 (16), Highest Certificate, Diploma or Degree (9), Labour Force Status (8), Age (9) and Sex (3) for the Population Aged 15 Years and Over in Private Households of Canada, Provinces and Territories and Census Metropolitan Areas, 2016 Census - 25% Sample Data.* Statistics Canada - 2016 Census. Catalogue Number 98-400-X2016263.

Statistics Canada - 2016 Census. *Aboriginal Identity (9), Major Field of Study - Classification of Instructional Programs (CIP) 2016 (43), Highest Certificate, Diploma or Degree (15), Registered or Treaty Indian Status (3), Residence by Aboriginal Geography (10), Age (9) and Sex (3) for the Population Aged 15 Years and Over in Private Households of Canada, Provinces, and Territories, 2016 Census - 25% Sample Data – Off-Reserve*. Statistics Canada - 2016 Census. Catalogue Number 98-400-X2016262.

Statistics Canada - 2016 Census. *Aboriginal Identity (9), Major Field of Study - Classification of Instructional Programs (CIP) 2016 (43), Highest Certificate, Diploma or Degree (15), Registered or Treaty Indian Status (3), Residence by Aboriginal Geography (10), Age (9) and Sex (3) for the Population Aged 15 Years and Over in Private Households of Canada, Provinces, and Territories, 2016 Census - 25% Sample Data – On-Reserve*. Statistics Canada - 2016 Census. Catalogue Number 98-400-X2016262.

6. Appendix 2: Key Informant Interviews

Indigenous Leaders on Education, Skills and Training programs and the Gap between Indigenous and Settler Society metrics in Literacy, Numeracy and Problem-solving in a Technology Rich Environment.

As an integral part of this project, the research team conducted zoom interviews with a dozen leading Indigenous and non-Indigenous administrators in Indigenous skills development and training. The individuals were promised anonymity to ensure that they would speak freely and frankly about their experience and those of their organizations and communities. Their analysis and commentary mirrored many of the insights gleaned from the literature review, albeit with a great sense of urgency and considerable criticism of current practices. Their observations provide important food for thought as government officials contemplate revisions to existing programs.

- The scale of the problem is both great and more complicated than is generally understood and that is included within the various federal problems. The complexities include, among other things:
    - The strong Indigenous preference for living and working in home communities and a related lack of interest in work mobility and relocation.
    - The systemic and serious employment problems facing Indigenous men.
    - The notable achievements of young Indigenous women in recent years.
    - The unique economic and employment issues facing Indigenous people in remote and rural areas.
    - Major shortcomings in the K-12 education systems, which provide a poor foundation for many young adults seeking to enter the workforce.
    - The very limited amount of research being done on Indigenous peoples in urban settings and in the retail and service sectors generally.
    - Extensive Indigenous reliance on cyclical and seasonal economic sectors.
    - The growing importance of Indigenous economic development corporations and the significant and unique hiring, retention and employment practices of Indigenous-owned companies and organizations.
- Additional funds are required, but money is not the primary problem facing organizations working in the field.
- The costs of applying for and reporting on government grants are significantly under-estimated and have a serious and negative impact on productivity and effectiveness.
- Government programs are often/typically short-term. Many programs require considerable ramp-up time and only achieve their maximum effectiveness over a long period of time. Government timelines do not match the needs of program deliverers and job seekers.

- Governments are seen as prioritizing program announcements and press releases, putting a greater emphasis on public awareness than program effectiveness.
- Indigenous autonomy in the management of employment and training is the overwhelming priority for Indigenous organizations. Government is seen as a significant barrier to effectiveness.
- Existing programs fail, at almost all levels and in all settings. The return on expenditure is extremely low – and one of the only successful job creation achievements are in the organizations offering employment and training services.
- The fundamental problem in many Indigenous communities is the absence of market-based jobs. Current employment systems assume that the market economy will absorb trained workers.
- Reliable and systematic data is nearly impossible to get on local circumstances. For example, there is virtually no recording of the "grey economy" returns or the economic benefits of harvesting activities. Planning for future employment and training in the absence of good data is close to impossible.
- Several organizations have implemented extensive mentorship programs. They have found supervised mentorships, focusing on long-term relationships, to be more successful than the standard employment and training programs.
- Far too little attention is paid to capacity building within Indigenous governments, which are now major and dependable employers of Indigenous workers.
- Training programs are rarely well-connected to local employment opportunities. Preparation of resource workers, for example, often starts too late to prepare new workers for the resource sector jobs.
- Existing programs and services do not do a great deal to improve the life chances of Indigenous men; they work much better for Indigenous women.
- In many communities, the crisis exists in human well-being not employment and training. Wellness initiatives are needed more than training programs.
- Often times, employment and training programs have become "jobs," providing regular and repetitive "employment" opportunities for Indigenous peoples.
- Current arrangements focus on sustaining existing organizations as much, if not more, than addressing the underling socio-economic problems facing Indigenous peoples and communities.
- Organizations typically spend more time and resources applying for and reporting on government grants than they do on helping Indigenous clients.
- The Government of Canada's short-term focus undermines attempts to develop continuity and sustainability in Indigenous programming.
- Indigenous controlled post-secondary institutions have developed a variety of employment-focused programs, including co-op offerings, which have had considerable success in supporting transitions to work.

- The civil service in Ottawa (which rarely sends officials into the field to see local realities) is cut off from understanding On and Off Reserve conditions. The lack of awareness of Indigenous circumstances is quite striking and worrisome.
- Changing government programs force organizations to abandon well-articulated local priorities to suit government needs. This is essential if funding is to be maintained.
- Several organizations are experimenting with ability-based, as opposed to credential-based, approaches to employment. Some of the initiatives include in-community training and remote work. While it is too early to know how well these approaches work in the long term, they have shown impressive results.
- Provincial governments have become increasingly active in the employment and training field. In some provinces, they have proven to be much more responsible to local/regional needs and interest. Some of the sub-national governments have been much easier to deal with organizationally. Increasingly, municipal, and regional authorities are interested in helping in the field.
- Existing approaches favour the "old economy" and have little appreciation for the different patterns and requirements of the "new economy." Several commented that this approach had the potential to leave Indigenous peoples outside the fastest growing sectors of the economy.
- Research on Indigenous employment and training provides little guidance for program administrators or for Indigenous people seeking work.
- Imprecise and unreliable data, much of it collected and managed outside of Indigenous control, damage attempts to develop more successful and effective programs.
- Despite the expenditure of hundreds of millions of dollars over the years, there is no solid evidence that the employment and training programs have:
  - Produced substantial and positive improvements in Indigenous employment outcomes
  - Adapted to meet the needs of specific regions or Indigenous communities
  - Dealt with the unique challenges of Indigenous men, the resource sector, and remote communities
  - Provided a reasonable return for the time, money and effort involved
  - Responded to the emergence of Indigenous-owned/managed organizations and companies
  - Established a positive and creative path for the future of Indigenous employment and training in Canada

Collectively, the KII provide a critical, even unflattering portrait of Government of Canada workforce development programs. They were not critical about the civil service but agreed that the current approaches were not working effectively. Some went as far as to argue that government programs were slowing Indigenous adaptations to the workplace and were taking up an inordinate amount of Indigenous administrative time.

As active professionals in senior leadership positions, their comments carry substantial weight and should be considered carefully. They reflect, in addition, the growing Indigenous emphasis on local control and self-government. Given the rapid transitions in the Canadian economy, the serious challenges facing rural and remote Indigenous communities, and the complex interplay of social, economic, cultural, and political forces at work in Indigenous populations, there is urgent need to get the employment pathways right. Present arrangements are not working, in the view of a dozen senior leaders in Indigenous employment and training.