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# Community-Led Transformation of the Housing and Education Systems by York Factory First Nation, Manitoba, Canada

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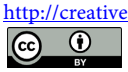




## Abstract

First Nation communities in Canada face systemic barriers to quality housing and education. This participatory research with Indigenous people from York Factory First Nation (YFFN) from 2022 to 2025 focused on youth capacity-building and developing funding proposals. The YFFN partnered with the University of Manitoba to compete successfully for a "rural, rapid housing" $8.4 million grant in 2023-2024 to fund infrastructure for the education and housing ecosystem of YFFN. This grant funded a state-of-the-art trades school building, four prototype housing designs, dormitory facilities and a Wikiwin post-secondary education program. The Wikiwin "earn as you learn" program offered 20 YFFN youth paid internships to build YFFN houses and take university courses in their community. To analyze the sustainable livelihood benefits of the Wikiwin program, all 20 Wikiwin students were surveyed when starting in 2023 or 2024, and again in 2025, with an 85% response rate (n = 17). A paired t-test found statistically significant ($p < 0.05$) increases in the Wikiwin student cohort's satisfaction with 12 of the 22 sustainable livelihood indicators after the Wikiwin program. The Wikiwin students' satisfaction levels increased statistically significantly ($p < 0.05$) for many human, financial, and social assets and at higher rates than the YFFN control group (n = 9). This case study found many benefits of community-led post-secondary education, offering a promising approach to transform education and housing systems in First Nation communities.

## Keywords

Indigenous, Housing, Education, First Nations, Post-Secondary, Homebuilding, Trades, First Nation, Indian Act

## 1. Introduction

Housing and education are key social determinants of health (WHO, 2025; UN, 2023; Adegun & Thompson, 2021). Indigenous youth living on First Nation reserves face systemic barriers to quality education and housing (Olsen Harper et al., 2023; TRC, 2015). The educational and housing inequalities on First Nation reserves across Canada undermine their self-determination (AFN, 2022; Statistics Canada, 2021a). Systemic barriers include poverty, underfunding, isolation, policy and limited infrastructure. These barriers to the social determinants of health are deeply rooted in colonial legacies (Layton, 2023; TRC, 2015).

The high rates of inadequate and unsuitable First Nation housing are well documented (Sallese et al., 2024; Statistics Canada, 2022; Thompson, 2024). Many health studies associate increased disease rates with inadequate and/or overcrowded housing (Adegun & Thompson, 2021; Kovesi et al., 2022; Shapiro et al, 2021). Inadequate First Nation housing is linked to infant death (Shapiro et al., 2021), pre-term births (Shapiro et al., 2021), physical injuries (FNIGC, 2012), respiratory illness (Kovesi et al., 2022), COVID-19 (Adegun & Thompson, 2021), *h-pylori* (Sinha et al., 2002), chronic stress, homelessness, and violence against women (Allary et al., 2023; FNQLHSSC, 2016). The much higher disease and disorder rates for First Nation people living on First Nation reserves than for any other group, including First Nation people off-reserve, Inuit, Metis and Canadian people (Carrière et al., 2016). These worse disease and disorder rates may be explained by the worse housing situation on First Nation reserves.

Housing and education improvements are needed to reduce inequalities on First Nation reserves. First Nation reserve schools face many systemic barriers, which negatively impact secondary education outcomes of Indigenous students (AFN, 2024; Olsen Harper & Thompson, 2017). Attainment of secondary school diplomas is hampered as half of schools on First Nation reserves do not deliver kindergarten to grade 12, and widespread shortfalls in education infrastructure funding (AFN, 2024). For example, York Factory First Nation's school in York Landing only went to grade 10 until 2022.

A critical look at First Nation education and housing issues is undertaken to understand the need to transform these systems. This study analyzes the impacts of the Wikiwin education partnership program of York Factory First Nation (YFFN) with the University of Manitoba. We discuss the education and housing needs at YFFN before we discuss the study method and findings. Wikiwin's goal is to transform education and housing in the north, but it starts with one regional hub. This longitudinal study examines Wikiwin's impact on the sustainable livelihoods of students since its inception in September 2023. Planning and policy recommendations from this case study for other First Nations and remote communities are discussed.

### 1.1. Education Crisis on First Nation Reserves

Lack of funding limits the quality of education on First Nation reserves. Until re-

cently, First Nations got a fraction of the public schools/students. Small, remote reserve schools fared the worst, despite higher travel and other costs (AFN, 2024). For example, schools at three of Manitoba's remote First Nations, namely York Factory, Shamattawa and Sayisi Dene, received about $10,000/ student on average or half of non-First Nation schools in the same region (AFN, 2024). The provincial-ly-funded Frontier School Board schools, operating in the same Northern Mani-toba regions, are double at $20,000/student.

School funding was insufficient in most First Nation schools. Many subjects suffered without funding to pay for specialty trades teachers (AFN, 2024). Lack of funding in First Nations for woodworking or other trades education contributes to a regional shortage of building trades professionals, architects, engineers, and others to design, manage, and build quality homes (AFN, 2024). School funding was also insufficient to offer all grades at half the schools in Canada (AFN, 2024).

Many schools in First Nation communities do not offer all grades needed, even at the elementary level. Only three-quarters of First Nation schools provide all grades from junior kindergarten to grade six (AFN, 2024). Secondary school education is not available to grade 12 in most First Nation reserves. Only 52% of First Nation schools go to grade nine, 46% to grade ten and 44% to grades 11 and 12 (AFN, 2024). The lack of local schools explains why more than half (54%) of First Nation students must leave their reserve to obtain a secondary school diploma and why many do not graduate from secondary school.

The colonial education system on First Nation reserves result in barriers to educational success. In 2018, approximately 44% of young people (ages 18 - 24) living on First Nation reserves completed secondary school, compared to 73% First Nations living off reserve and 88% of Canadians of the same age (AFN, 2024; Statistics Canada, 2021a). The rates are even worse for First Nations students in Manitoba (AFN, 2024; Statistics Canada, 2021a).

Another barrier to quality education is half of First Nation schools are overcrowded (AFN, 2024). Studies show overcrowded classrooms adversely affect students' outcomes and confidence by decreasing the quality and quantity of teaching and learning (Jameel & Aslam, 2025). Further, overcrowded schools provide no dedicated space for a shop or other trades class. Apprenticeship-level shops solely operate in the provincial schools in many provinces, including Manitoba. Apprenticeship training on First Nations reserves to build capacity, housing and academic attainment remains an unmet need. This need could be met through the needs-based funding recently adopted for First Nations schools as Canadian policy (AFN, 2024).

Post-secondary trades education access is limited for remote and rural First Nations (AFN, 2024). Colleges and universities are rarely located in First Nation communities. Students on First Nation reserves, particularly those in remote and rural reserves, have to travel long distances to get to a university (AFN, 2024). First Nations' post-secondary participation, living on reserve, is lowest in Manitoba (21%) of all provinces and territories in Canada (AFN, 2024; Statistics

Canada, 2021a). Professional and skilled trades options on First Nation reserves secondary and post-secondary schools are not available, although this would retain students and increase job options (Gloux, 2021).

### 1.2. The Housing Crisis on First Nation Reserves

First Nations are a hotspot for inadequate and unsuitable homes (Statistics Canada, 2022; McCarthy Tetrault, 2024). Six times as many homes on First Nation reserves are inadequate compared to Canadian homes generally (Statistics Canada, 2022). Inadequate housing includes the lack of running water, structural issues, safety issues, and water intrusion (Statistics Canada, 2022). Houses on First Nation reserves are often inadequate, needing major repairs to protect inhabitants from weather conditions, health hazards, or safety concerns (Statistics Canada, 2022).

Substantive health risks are associated with inadequate First Nation housing. The health risks associated with inadequate First Nation reserve housing include infant death (Shapiro et al., 2021), pre-term births (Shapiro et al., 2021), physical injuries (FNIGC, 2012), respiratory illness (Kovesi et al., 2022), COVID-19 (Adegun & Thompson, 2021) and other diseases (Jones et al., 2012; Minuk & Uhanova, 2003; Eusebi et al., 2014; Bernstein et al., 1999; Sinha et al., 2002). Housing inadequacy is impacted by physical location, with many First Nation reserve houses located in flood plains, without dikes for protection, and in fire fuel hazard areas, without fire stations (Rolfe et al, 2020; FNIGC, 2012; Elash & Walker, 2019). Inadequate homes deteriorate rapidly if not repaired. Major repairs and more housing are needed on many First Nation, particularly in Manitoba.

Most First Nation reserves lack enough housing, resulting in unsuitable housing (ISC, 2023). Lack of sufficient houses result in overcrowding and multiple generations living together by necessity (Statistics Canada, 2022). Unsuitable housing is an indicator of overcrowding, with the National Occupancy Standard (NOS) based on the adequacy of bedrooms for the size and composition of the household (Statistics Canada, 2013). Unsuitable housing is defined as having more than two people of any sex over five; or two people of the same sex under 18, if not in a relationship (Statistics Canada, 2013).

Many First Nation people on reserve live in overcrowded housing, which is defined as unsuitable. Over one in five (21.4%) or 224,280 First Nations people lived in unsuitable First Nation reserve housing in 2021 (Statistics Canada, 2022). The First Nation reserve rate for unsuitable housing is more than double Canada's rate. Manitoba's First Nations people living in First Nation reserve housing experienced four times higher overcrowding housing rates (38%) than other Canadians (9.7%) in 2021 (Statistics Canada, 2022). First Nation reserves' housing rates in Manitoba hovering around 40% for all ages and 60% for youth for the last 15 years (Statistics Canada, 2022). Overcrowding is associated with many negative public health outcomes. Overcrowding is associated with higher rates of infectious diseases, including tuberculosis, hepatitis and COVID-19 (Kovesi et al., 2022;

Mallach et al., 2023; Perreault et al., 2022; Adegun & Thompson, 2021). The dire housing situation on IRs needs policy and programming shift to innovative solutions.

Remote First Nations have both the highest rates for inadequate and unsuitable housing (Harvey, 2016; Statistics Canada, 2022). Manitoba's First Nation housing crisis is due partly to having about one-third of its 63 First Nations lacking roads (ISC, 2023; Statistics Canada, 2022). St. Theresa Point First Nation, a remote northern Manitoba community in Island Lake, has the highest rate (57%) of overcrowded housing for any First Nation in Canada (Statistics Canada, 2022).

The underfunding of First Nation homes typically results in small homes on reserves. The small First Nation homes are a mismatch with the big First Nation families (Kovesi et al., 2022; Statistics Canada, 2022). Despite being much smaller, First Nation homes hold an average of three times the people of other homes in Canada (Kovesi et al., 2022; Statistics Canada, 2022). A study of four reserves included 98 houses of average size of 243 $m^3$ (SD 114) with a mean occupancy of 6.6 people/house (Kovesi et al., 2022). In these small homes on the four reserves studied, as many as 17 people resided (Kovesi et al., 2022). The average home size of 243 $m^3$ on IRs is smaller than half the size of the average medium-sized off-reserve house, 500 $m^3$ (range 400 - 600 $m^3$), despite smaller families (Kovesi et al., 2022).

Funding for many thousands of First Nation houses is needed (AFN, 2022). The Assembly of First Nations (AFN, 2022) estimated a shortage of 133,770 housing units on IRs. The decades of federal underfunding are estimated to require $44 billion to resolve overcrowding and repairs on first Nation reserves. An additional $16 billion is estimated to be required to meet future needs for population growth and migrations to reserves by 2040 (AFN, 2022). This financing of IR housing cannot be met by the market due to the *Indian Act* restrictions voiding all mortgages (Indian Act, 1985).

### 1.3. The Indian Act Undermining Housing on Reserve

Different laws on First Nation reserves create worse housing and health outcomes for the First Nation people living there (Indian Act, 1876; Statistics Canada, 2022). The First Nation reserve housing is recognized as a distinct type of tenure by Statistics Canada (2021c), with its own unique category:

"For historical and statutory reasons, shelter occupancy on Indian reserves or settlements does not lend itself to the usual classification by standard tenure categories. Therefore, a special category, "dwelling provided by the local government, First Nation or Indian band," has been created." (Statistics Canada, 2021c).

First Nation reserve housing has funding and financing limited to federal transfer funding, due to the *Indian Act* restrictions (Indian Act, 1985). The Indian Act prohibits bank loans for reserve housing, giving First Nations people no options for financing First Nation housing (Allary et al., 2023; Oni et al., 2023; Indian Act, 1985). The only financing allowed is Canadian Mortgage and Housing Company (CMHC) loans on a maximum 25-year mortgage backed by a Canadian ministe-

rial guarantee. This ministerial guarantee creates a huge bureaucracy and only provides a few houses on each First Nation reserve each year (Zingel, 2020). Federal underfunding created a shortfall for First Nation housing estimated at $59 billion, resulting in severe overcrowding and inadequate housing (AFN, 2021).

The Indian Act limits housing, including but not limited to financing (Indian Act, 1985). Off-reserve, everyone can own a home and apply for a mortgage to build or buy their house, but this is not possible on First Nation reserves (Indian Act, 1985). Off-reserve houses can be sold by the owner to build equity, but not on First Nation reserves. Off-reserve, anyone can reside in available housing, not only band members, whereas housing on First Nations is restricted to registered-status Indian band members and their children. This restriction of who occupies reserve housing and nullifying borrowing against reserve land is restrictive, without market options. The *Indian Act*, from 1876 to this day, voids all mortgages from banking institutions or other lenders to this day, stating:

"No person, or Indian other than an Indian of the band, shall settle, reside or hunt upon, occupy or use any land or marsh, reside upon or occupy any road, or allowance for roads running through any reserve belonging to or occupied by such band; and all mortgages or hypothecs given or consented to by an Indian and all leases, contracts and agreements made or purporting to be made by any Indian, whereby persons or Indians other than Indians of the band are permitted to reside or hunt upon such reserve, shall be absolutely void". (*Indian Act*, 1876: s. 11).

The *Indian Act* undermines First Nation reserve housing (McCartney et al., 2018). Bailie and Wayte (2006) explain that the *Indian Act* control over housing perpetuates colonialism's deep-rooted effects by reducing housing security, self-determination, and well-being. The federal government's management of reserve housing started in the 1960s and 1970s, without planning for population growth, maintenance, and repair (AFN, 2021; Belanger, 2016). Without future-proofing the plan, housing quickly fell into disrepair and was overcrowded by the 1980s to this day. These First Nation reserve homes, also, were built without adequate services such as piped water and sewage, particularly in the prairies (Hill et al., 2020).

Inadequate and overcrowded housing results in negative health outcomes for First Nation people on reserves. Carrière et al. (2016) found higher disease rates for First Nation people living in First Nation housing compared to any other group, including First Nation living off-reserve, Metis, Inuit and Canadian people. The contrast in health status between First Nations peoples on reserves and non-Indigenous people were greatest for all diseases and disorders studied (Carrière et al., 2016). First Nations peoples' rates for diseases and disorders on First Nation reserves were three to five times higher than for non-Indigenous people, including for endocrine, nutritional, and metabolic diseases (rate ratio (RR) = 4.9), mental and behavioural disorders (RR = 3.6), diseases of the respiratory system (RR = 3.3) and injuries (RR = 3.2) (Carrière et al., 2016). Many other health studies linked increased disease rates with inadequate and/or overcrowded housing (Kovesi et al., 2022; Adegun & Thompson, 2021; Sinha et al., 2002; Jones et al., 2012;

Minuk & Uhanova, 2003; Eusebi et al., 2014; Bernstein et al., 1999) and negative birth outcomes of infant death and pre-term births (Shapiro et al., 2021), as previously discussed.

Housing rights and human health of First Nations people on First Nation reserves are undermined by the *Indian Act.* With barriers to normal financing, housing on First Nation reserves is the fiduciary responsibility of Canada. Canada's responsibility for inadequate, overcrowded First Nation reserve housing that negatively impacts the health of First Nations people is the position taken by a class action lawsuit by St. Theresa Government. Chief Flett of St. Theresa Point First Nation commenced a national class action litigation against the Attorney General of Canada for "damages caused by its negligence in creating and failing to remedy the lack of access to adequate housing on First Nation Lands" (McCarthy Tetrault, 2024). This class action aims to hold the Government of Canada accountable for the IR housing crisis, asking for $5 billion in compensation for past negligence, and demanding the federal government provide adequate housing to First Nations people on IRs (McCarthy Tetrault, 2024). This court case applies to YFFN and other First Nations with high rates of inadequate and overcrowded housing.

### 1.4. The Sustainable Livelihood Framework

The sustainable livelihoods framework is a holistic way to measure the major factors influencing people's lives (Oni et al., 2023; Thompson, 2024; Ballard & Thompson, 2013). The sustainable livelihood framework identifies key assets and capitals to measure. Canada's model for Sustainable Livelihoods Assets includes six core assets, namely physical, social, human, financial, personal, and health assets (Sustainable Livelihoods Canada [SLC], 2021). Britain's Department for International Development (DFID) model considers five assets, namely physical, human, financial, social and natural assets. The core assets in both SLC and DFID shown in **Figure 1** are the physical, human, financial, and social assets.

Sustainable livelihood assets are needed to attain a good life and can be measured at the individual, household, and community level (Thompson, 2024; Oni et al., 2023). These assets for livelihoods are impacted by factors (e.g., programs, policies, livelihood strategies, trends, etc.). This transformation of sustainable livelihoods resulting from programs and other factors is shown in **Figure 2**. A sustainable livelihood is able to resist, recover and adapt from shocks without degrading ecosystem services (Serrat, 2008). Supporting sustainable livelihood assets are key to addressing exclusion and poverty to support individual and community development.

Physical assets are the infrastructure required to meet "basic needs" (SLC, 2021). The physical assets include safe housing, grocery store, childcare facilities, affordable transportation, safe and clean water, production equipment and other services (SLC, 2021; Serrat, 2008). The social assets involve collaborative relationships and social connections which individuals can rely on for support (SLC, 2021). The social assets include family support, friendships, and political partici-

pation, relationships with mentors, network connections within the community and between the community and external partners (Thompson, 2024). Human assets for sustainable livelihoods comprise the skills, capacity for employability and ability to adapt. Human assets include education (formal or informal), knowledge, acquired skills, employability skills, health and leadership skills. Financial assets include income, savings, financial services, banking services, access to credit and credit ratings (SLC, 2021).

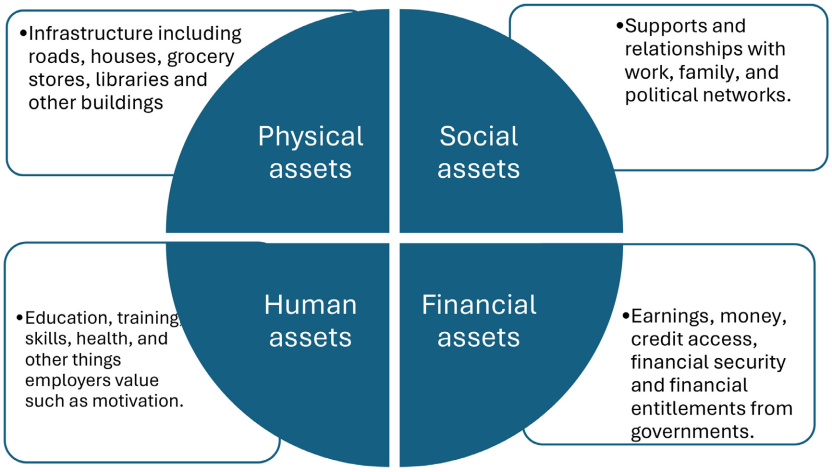



**Figure 1.** The core sustainable livelihoods in multiple frameworks.

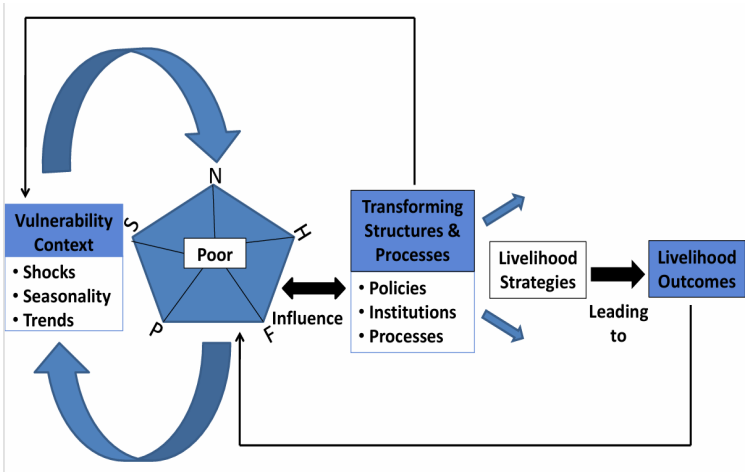



**Figure 2.** The sustainable livelihoods framework. Source (Thompson, 2024; Modified from DFID Sustainable Livelihoods framework, 2000).

## 1.5. York Factory First Nation (YFFN)

York Factory First Nation (YFFN) is an Ininew (Cree) community in Northern Manitoba in Canada. Their Ininew homeland, since time immemorial, are the lowlands and shores of Hudson Bay around the mouths of the Hayes, Nelson and Kaskatamagan Rivers. The YFFN territory in Manitoba's Hudson Bay Lowlands is largely intact with a critically important ecosystem for polar bears, beluga whales, seals, moose, herds of caribou, and over 250 species of birds (Puzyreva et

al., 2025). The Ininew were forcibly displaced from their Native land along Hudson Bay, shown in **Figure 3** (York Factory First Nation, 2021). This displacement was after the 1957 closure of the Hudson's Bay Company (HBC) Headquarter that was located at the York Factory fur trading post.

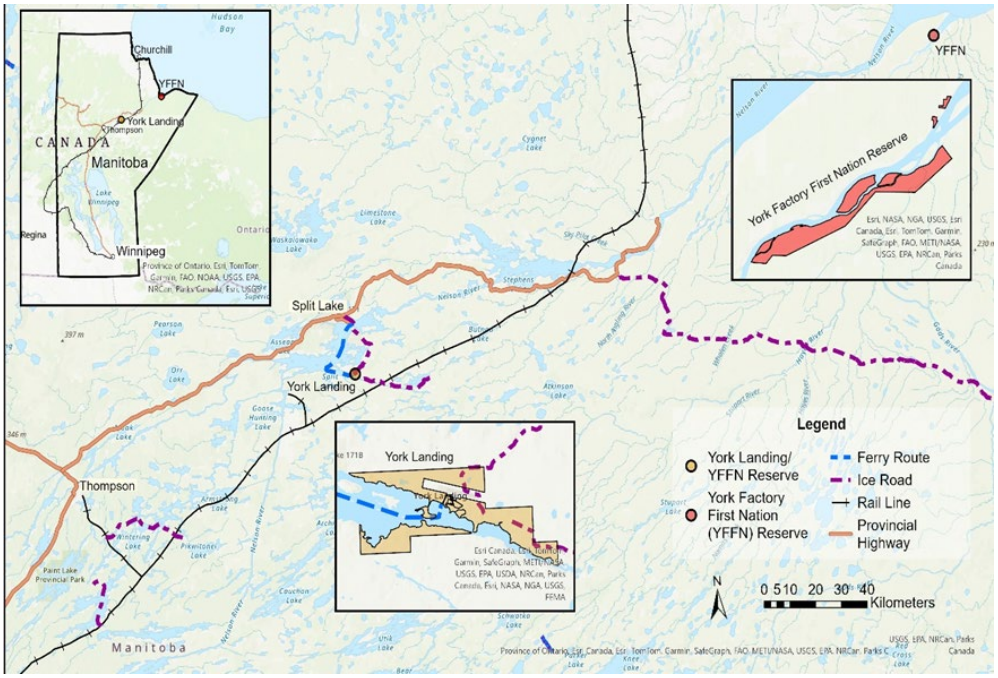



**Figure 3.** York Factory First Nation reserve on Hudson Bay and in York Landing, Manitoba, showing the limited access and its location in northern Manitoba.

The York Factory Ininew were displaced in the fall of 1957. The colonial government sent the Ininew people by canoe up the Nelson River to York Landing (Parks Canada Agency, 2022; Kiinawin Kawindomoni, 2024). The YFFN Ininew were relocated 116 km from Thompson to York Landing on the eastern bank of the Nelson River (Keewatin Tribal Council [KTC], 2024; York Factory First Nation, 2021). The Ininew homes at York Factory were burned to prevent the Ininew returning, despite York Landing having no roads or houses in 1957. Without all-weather roads to this day, York Landing must be accessed by boat or winter road, as shown in **Figure 3**, which is dangerous due to Manitoba Hydro megadams' fluctuating Nelson River's water levels. A state of emergency was called in summer 2025 due to wildfires nearby and water levels being to low for their ferry (Ringos, 2025) to provide a means to mass evacuate. The ferry was cancelled due to low water levels at great hardship to community members and limiting the materials that could be shipped for building, food and fuel supplies.

### 1.6. The Wikiwin Education Program

The Wikiwin Polytechnic Institute was created by YFFN in 2023 to bring education home to YFFN. Wikiwin was modelled after the successful Mino Bimaadiziwin Homebuilder program in Wasagamack and Garden Hill First Nations (Oni

et al., 2023). Prior to being the YFFN Chief, Darryl Wastesicoot was the Homebuilder instructor for the Anokiwin Training Institute and the University of Manitoba's Mino Bimaadiziwin (MB) partnership. Darryl has more than 30 years experience as a construction engineer and was a great teacher who saw what a difference this Homebuilding program made for the youth. After becoming YFFN chief, Chief Wastesicoot partnered again with University of Manitoba, explaining "this program really works" (Hill & Thompson, 2023).

## 2. Method

This study investigates whether the Wikiwin program provided benefits to Wikiwin students and the YFFN community. The chief and the YFFN community wanted participatory research to build capacity, housing and share the Wikiwin story, which involved creating the Wikiwin Education Program. We followed the Ownership, Control, Access, and Possession (OCAP) protocols, to inform how First Nations' data and information were collected, protected, used, or shared (First Nations Information Governance Centre (FNIGC, 2012)). Research occurred after the survey and process was approved at meetings with YFFN chief and community members. We followed OCAP protocols to co-develop this research with the chief and community. At each stage we consulted with community people for feedback on priorities, research methods, the process, data storage and publications. We provided draft versions of the following materials: proposal presentations, funding proposals, course programming, preliminary findings and videos. The community review process for the final manuscript included approval from chief and community members before publication and co-publishing with the chief.

### 2.1. Participatory Research

The Wikiwin education program was the community-led intervention to bring education home to YFFN engaging University partners. We engaged through participatory research with the YFFN community and YFFN students to create the Wikiwin program through the YFFN-University of Manitoba partnership. The University of Manitoba was chosen as the post-secondary partner, due to one author, Dr. Thompson, working with the YFFN chief previously with the Mino Bimaadiziwin partnership on housing in Island Lake First Nations. To bring education home and improve sustainable livelihoods of YFFN youth, this YFFN-university partnership created the Wikiwin intervention as an "earn as you learn" University and housebuilding education program. The University partner was able to establish a pilot cohort education program, with different university credit courses offered by distance, at first, and then in person at YFFN. The YFFN also enlisted Dr. Thompson to write funding proposals for infrastructure with CMHC and programming with MITACS. We then conducted research at YFFN, as their partners at the University, with the Wikiwin student cohort. University partners documented Wikiwin meetings, proposal success, building efforts and conducted a longitudinal survey from 2023-2025.

### 2.2. Longitudinal Survey Participant Criteria

We undertook a longitudinal survey to analyze the Wikiwin program's benefits on Wikiwin students, tracking changes over time. All participants who took the survey met the following criteria. They were: 1) Indigenous, 2) living in York Landing, 3) between 18 and 35 years old, and 4) received the same honorarium amount ($40/pre-survey and $60/post-survey). All participants are Indigenous youth presently living in the YFFN community, with some originating from Garden Hill, Nelson House, War Lake First Nations, and Winnipeg. In total, forty Indigenous youth living in the YFFN community of York Landing participated in the pre-survey between 2023-2024 in person. The pre-survey respondents included two groups of equal number: 1) Wikiwin students (n = 20); and, 2) control group (n = 20). Half (n = 20) took courses and homebuilding internships through the Wikiwin program. The other half (n = 20) were not interns in the Wikiwin-University partnership in this non-random community trial. The Wikiwin and control groups were distinct: a participant in the control group was independent of the Wikiwin student group. Following the survey, all respondents, both control and Wikiwin survey respondents, each received the same level of honorarium.

### 2.3. The Survey Instrument and Ethics

The Work Integration Social Enterprise (WISE) longitudinal survey, under ethical protocol HS21434, was applied in a paired t-test design separately for both the Wikiwin student cohort and the control group. The ethical protocol provided confidential test results. For photos, videos and other participatory research a consent form was signed by each student providing permission for videos and photos of public events. Although all surveys were confidential, with the names not associated with any survey findings, people signed consent forms allowing their videos and pictures to be taken for promotion and research.

This WISE longitudinal survey was previously verified for measuring impacts of training programming for at-risk youth (Oni et al., 2023). This survey had previously assessed homebuilding programs with First Nations (Oni et al., 2023), as well as other at-risk youth groups across Canada. This survey measured sustainable livelihoods, specifically financial, social, human, and physical assets' satisfaction levels on a scale of 1 to 5 (1 = very dissatisfied and 5 = very satisfied). The pre-survey was conducted by Dr. Thompson with Wikiwin students after their acceptance and start in the Wikiwin program, whether that start occurred in 2023 or 2024. The control group pre-survey was conducted at that same time.

### 2.4. The Statistical Design

This design looks for a statistical difference within a group at different points in time, in 2023 or 2024 when they started the program and in 2025. This design applied to the Wikiwin student cohort analyzed for the mean differences at the beginning of the Wikiwin program and after at least one year in the Wikiwin program. The paired t-test asks if there is a statistical difference ($p < 0.05$) between

the means of two dependent samples after the Wikiwin education program intervention. The control group at YFFN received no treatment or intervention and is compared with its mean to see whether a similar impact occurred without an intervention.

A between group analysis will be undertaken in a different paper to compare the Wikiwin cohort and the control group's outcomes. The ANCOVA analysis between the Wikiwin cohort and control group found statistical significance ($p < 0.05$) for seven of the twenty-two assets studied in this paper, covering each asset for human (motivation), financial (personal income, ability to pay for food and ability to pay for housing), social (relationship with mentors) and physical (safety in the home) assets. This ANCOVA of direct group comparison helped to determine that the Wikiwin program, rather than other confounding factors, caused the observed improvements, but not the impact of Wikiwin on students, independent of community impacts. This paired t-test analysis was needed to see specifically the Wikiwin factors that benefited the Wikiwin student cohort, considering that the Wikiwin funding was expected to have a community level impact, which would impact a control group at YFFN as well. Thus, the purpose of this paper was to explore the impacts on the Wikiwin students of the Wikiwin program, specifically.

## 2.5. Post-Surveys

The post-survey was taken by all respondents in 2025. The post-survey was taken either when visiting the YFFN community or by zoom with a survey participant. For the Wikiwn students' post-surveys were undertaken a year or more after they joined the Wikiwin program. This corresponded with the post-surveys with the control group, which occurred at least a year after their pre-survey. People were contacted for the post-survey based on the information provided, but some had moved or were unavailable to complete the post-survey. The lack of telephone services, without YFFN having satellite service or community-wide WIFI, and the remoteness of the YFFN community made collecting post-surveys difficult.

The post-survey was completed by 17 of the 20 Wikiwin students and nine of the 20 control group participants. The response rate for the Wikiwin students was 85% while that of the control group was 45% as shown in Table 1. The control group was a comparison for the Wikiwin group to investigate if changes recorded over time were attributable to the Wikiwin program intervention or other factors in the community.

Table 1. Participants' response rate, Pre- and Post-survey for the two different groups.

| Participants | Pre-Survey | Post-Survey |
|---|---|---|
| Wikiwin Student Cohort of 20 | 20 | 17 (85%) |
| Control Group | 20 | 9 (45%) |
| Total | 40 | 26 (65%) |

We compared the pre-survey to the post-survey using a paired t-test. This within-group analysis of Wikiwin impact was the main focus. The control comparison was to see if any difference was attributable to other factors in YFFN changing or whether the Wikiwin intervention was making the difference.

### 2.6. Data Analysis

The data were compiled in Microsoft Excel for Microsoft 365 MSO (version 2506) and analyzed by the Statistical Program for Social Sciences (SPSS) software, version 27.0.1. Descriptive analysis of demographics and sustainable livelihoods were undertaken. Inferential statistics using hypothesis testing (paired t-test) were used to determine if any differences in outcomes (satisfaction levels) before and after participation in the Wikiwin partnership. The null hypothesis ($H_0$) is the Wikwin program has no effect on Wikiwin student sustainable livelihood indicators. The alternative hypothesis ($H_1$) is that the Wikwin program has an effect on Wikiwin student sustainable livelihood indicators. In a paired t-test each respondents' initial pre-survey is compared with that person's post-survey.

The Shapiro-Wilk test for assessing normality was conducted on both the pre- and post-Wikiwin students' data and the control group data. The Shapiro-Wilk test indicated normally distributed data for both pre- and post-survey results for the Wikiwin and the control group. Since all assumptions of the paired t-t est were met, including assumptions for outliers, the data were analyzed using the paired t-test. The paired t-test determined the mean and statistically significant levels of satisfaction for the various sustainable livelihoods.

### 2.7. Limitations of the Study

This study had limitations due to its small number of participants. The low sample size was limited by the Wikiwin cohort being only 20 students to date. The small sample sizes of the Wikiwin (n = 17) and control group (n = 9) limit the statistical power. The lack of statistical size for the control group may be due to smaller changes or the smaller size of nine responding to post-survey. Thus, we only compared between Wikiwin and control groups for mean pre-/post- difference and not for statistical significance. The low response rate for the control group indicates a high "dropout rate", characteristic of longitudinal surveys, which can introduce a nonresponse bias (Asendorpf et al., 2014; Holtom et al., 2022). The high dropout rate is common in longitudinal surveys and may be due to various factors, including personal and geographical reasons.

## 3. Findings and Discussion

### 3.1. The Wikiwin Youth Demographics

The pre-survey respondents (n = 20) were comprised of 75% men and 25% women, as shown in **Figure 4**. All the five women remained in the Wikiwin post-survey resulting in a slightly higher proportion of 29% women. The control group gender ratio for the pre-survey matched the Wikiwin numbers to keep the sample

similar for gender. Female participation in the Wikiwin program, while low, is more than triple the rate in the construction and homebuilding field, which is heavily male dominated (92%), with few women (8%) (Statistics Canada, 2021a). The average age was 30 years of age in the pre-survey but dropped down to 28 years of age post-survey, due to a few older students moving on to other programs.

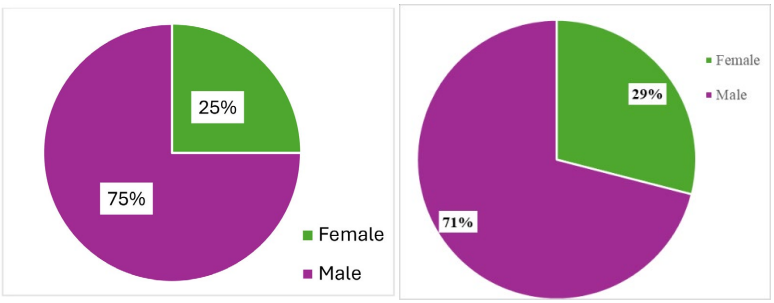



Figure 4. Wikiwin students' gender in pre-survey (n = 20) and post-survey (n = 17) with five women in both pre- and post-Wikiwin.

### 3.2. The Wikiwin Program Intervention

The Wikiwin program intervention was studied holistically to determine its impact on student sustainable livelihoods. The survey analyzed livelihood assets for human, financial, social and physical assets, before and after students started the Wikiwin program. The Wikiwin program had 20 YFFN youth gain admittance to the University of Manitoba for courses and internships from 2023 to 2025. Courses started for ten students in winter 2023 and the cohort grew to 20 students later in 2024. Students typically took two courses per year. Wikiwin students attended specific university courses from diverse departments as a cohort in the fall and winter terms starting in January 2023 to December 2025 as shown in Figure 5. Coaching, tutorials computers and other supports were provided to improve the university learning experience.

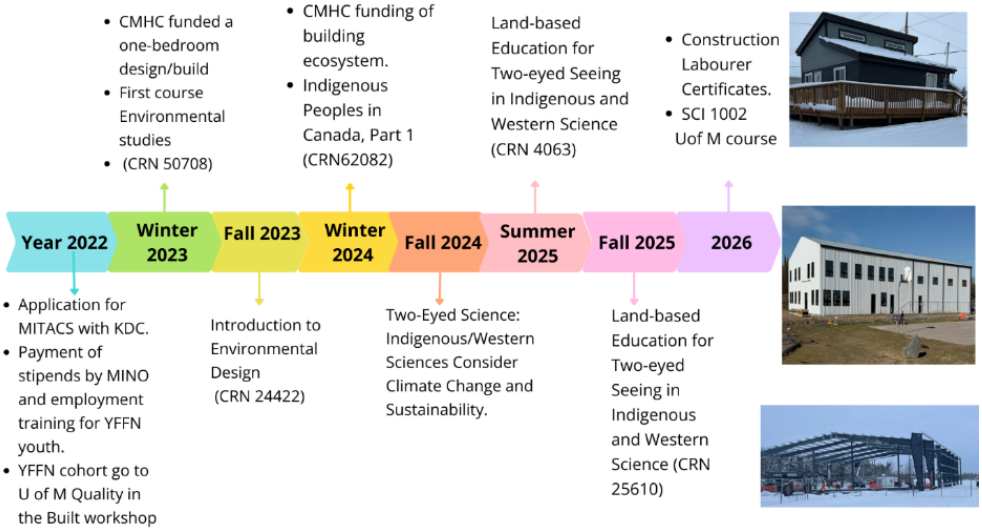



Figure 5. The timeline for the Wikiwin-University program intervention from 2022 to 2026.

All 20 Wikiwin students were employed by the University of Manitoba through a MITACS internship with the Kawéchiwasik Development Corporation (KDC), which is owned by YFFN. The YFFN employment training program worked with KDC in 2024 and/or 2025 to deliver meaningful housebuilding supervision for work and training of the Wikiwin student interns. Further, Dr. Thompson provided the academic supervision and tutorial support for all the university classes. The Wikiwin internships were a partnership between YFFN and University of Manitoba with MITACS tripling the training dollars through their innovative internship program. Thus, these 20 students were paid to "earn as you learn", in internships where students built and repaired homes, while taking one University of Manitoba course per term (CMHC, 2023; Hill & Thompson, 2024; Eco-Health Learning Circle, 2023).

### 3.3. Human Assets

Human assets include schooling, training, job skills, motivation, optimism, stress management and other aspects that increase employability (SLC, 2021). The Wikiwin program improved students' educational attainment, as shown by the increased education level attained in **Figure 6**. All the students succeeded in diverse courses at the university level. University courses, delivered by distance or in the community, resulted in major changes with all post-Wikiwin students attending post-secondary (88% having some post-secondary and 12% college certificates), increasing from 30% (18% having some post-secondary and 12% college certificates). This success was despite most Wikiwin students not being able to complete high school, as the YFFN school only went to grade ten.

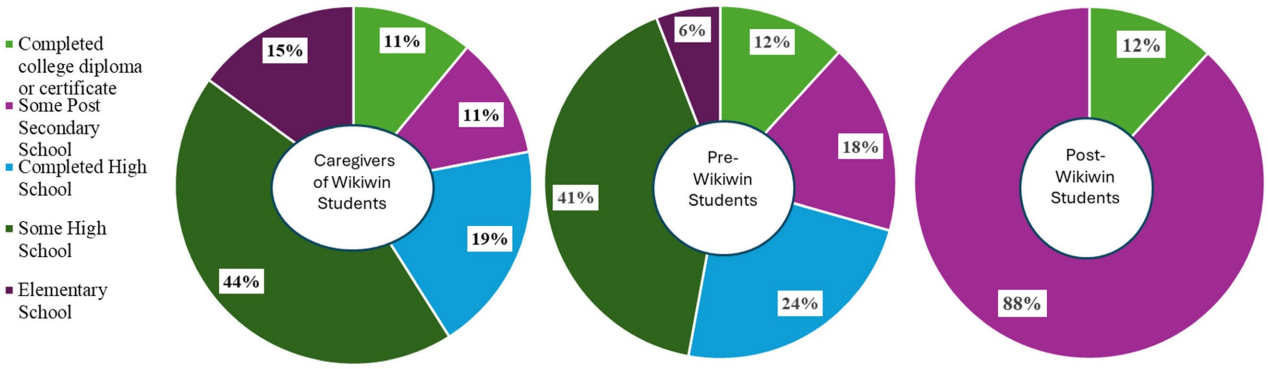



**Figure 6.** Highest education level of caregivers of Wikiwin students (n = 28) and Pre-Wikiwin students (n = 20) at YFFN remain low until Wikiwin provided post-secondary schools (n = 17).

The intergenerational barriers to education were evident from the survey results. The pre-Wikiwin students' highest education attained was roughly at the same level as earlier generation of their caregiver. **Figure 6** shows that 6% of Wikiwin students did not complete elementary school and 41% had some secondary school but did not complete secondary school. This highest grade attained is only slightly higher than their parents/grandparents or other caregiver at 15% and 44%,

respectively. Thus, half of both generations at YFFN stopped their education below high school completion. The low educational attainment is explained by the lack of access to secondary and post-secondary education. The local YFFN school only went to grade ten until 2021. The lack of access to secondary and post-secondary school explains the lower educational attainment. In addition, many caregivers attended the residential school system, which created a stigma around education and impacted not only themselves but future generations.

The human assets of the Wikiwin students improved dramatically after the Wikiwin. Six of the seven human assets of Wikiwin students improved statistically significantly post-survey. Within the Wikiwin group the satisfaction levels were much higher post-survey than pre-survey, which is the mean difference (MD), for these six human assets: formal education schooling (MD = 1, $p < 0.05$), training apart from school (MD = 1.3, $p < 0.05$), job search skills (MD = 1.1, $p < 0.05$), stress management (MD = 1, $p < 0.05$), motivation (MD = 1, $p < 0.05$), and optimism (MD = 0.7, $p < 0.05$).

The only item not statistically significant for Wikiwin students was job skills. However, Table 2 shows job skills post-survey satisfaction was higher (Mea = 3.8) compared to the control group (Mean = 3.2). This small change for Wikiwin students may be explained from their job skill satisfaction being high at the pre-survey stage, as the Wikiwin cohort self-selected for those having construction background.

Table 2. Pre- and post-Wikiwin partnership's mean difference (MD) and standard deviation (SD) for Wikiwin students and the Control group for Human Assets. Legend: * Sig = statistically significant at $p < 0.05$ for paired t-test for Wikiwin and paired t-test for control group.

| **Human assets** rating on a 1-5 satisfaction scale. | **Wikiwin students** (n = 17) | | | | | **Control group** (n = 9) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **Mean Pre-** | **Mean Post-** | **MD** | **SD** | **Sig. (p)** | **Mean Pre-** | **Mean Post-** | **MD** | **SD** | **Sig (p)** |
| Schooling or formal education | 2.23 | 3.21 | 0.98 | 1.47 | 0.014* | 2.33 | 3.00 | 0.660 | 1.66 | 0.26 |
| Training apart from school | 2.27 | 3.53 | 1.25 | 1.46 | 0.003* | 2.22 | 2.78 | 0.556 | 1.67 | 0.35 |
| Job search skills | 2.29 | 3.41 | 1.12 | 1.93 | 0.030* | 1.78 | 2.44 | 0.667 | 1.80 | 0.30 |
| Stress Management | 2.71 | 3.70 | 0.99 | 1.77 | 0.034* | 2.56 | 2.44 | −0.111 | 1.76 | 0.86 |
| Job skills | 3.73 | 3.76 | 0.03 | 1.20 | 0.911 | 2.11 | 3.22 | 1.11 | 1.97 | 0.13 |
| Motivation | 3.06 | 4.06 | 1.00 | 1.00 | 0.010* | 3.00 | 3.11 | 0.111 | 2.57 | 0.90 |
| Optimism | 2.76 | 3.41 | 0.65 | 1.17 | 0.037* | 2.50 | 2.75 | 0.250 | 2.25 | 0.76 |

Wikiwin provided both formal and informal learning pathways for the Wikiwin students. These pathways help explain the increase in the level of satisfaction post-Wikiwin for Wikiwin students. These Wikwin students "earned as they learned", with funding provided through a MITACS homebuilding internship supervised by KDC and YFFN employment training. Wikiwin students learned carpentry skills, built houses and installed helical piles, under the guidance of an Indigenous expert trainer and various contractors. (Figure 7)

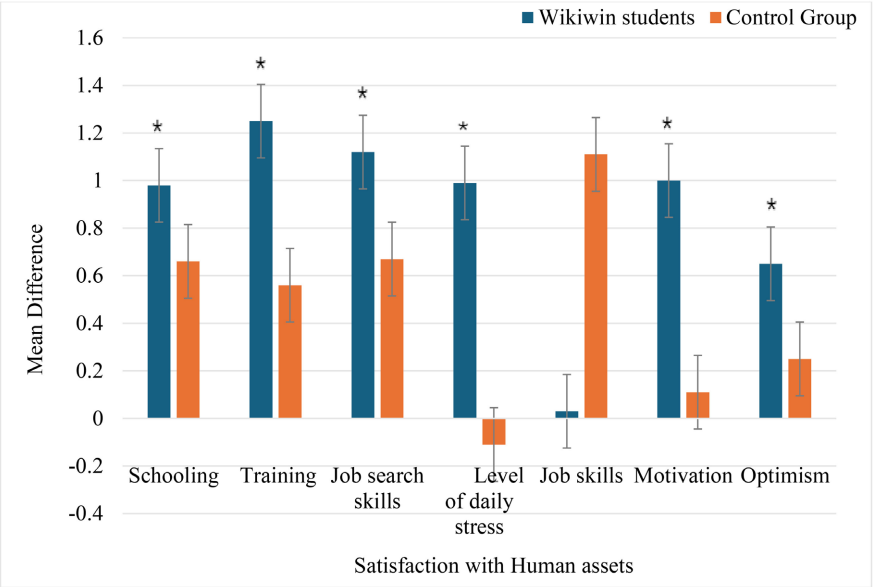



**Figure 7.** Human asset satisfaction level change pre- and post-Wikiwin for Wikiwin students versus the control group. Legend: * Statistically significant at $p < 0.05$.

All Wikiwin students succeeded in all their University courses. Wikiwin students succeeded at diverse courses, including distance and in-person community-based courses. This required lots of coaching and support, particularly for those without grade 12. A few Wikiwin students got excellent grades, with most getting grades of B, C or Ds, which is normal for any university class. However, all Wikiwin students passed. Students were proud to be part of a post-secondary education system.

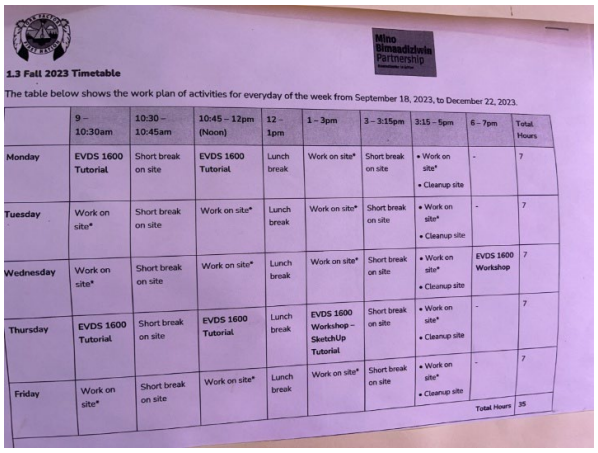
Wikiwin students preferred hands-on courses that occurred in the community. These in-person courses offered Ininew stories, language teachings and land-based activities exploring and sharing Indigenous knowledge. Two-eyed seeing approaches had students, reporting to Elders, after conducting housing and school inspection labs using thermographic cameras and different air quality monitors. Another course had students building a large-scale aeroponic systems to grow fresh vegetables for YFFN and installing the YFFN air quality monitoring system. Thus, new in-person pilot courses were created with Science. The relevance and hands-on aspects engaged the youth, as shown in **Figure 8** and **Figure 9(a)**. **Figure 9(b)** shows the work, tutorial and class schedule for one term.

Distance courses offered opportunities for the cohort to study at YFFN but had drawbacks. Initially, the Wikiwin students took a few distance courses, including environmental science, Indigenous studies and architecture design. Many Wikiwin students struggled with the amount of reading and its relevance. Many barriers were circumvented by Wikiwin support. To foster interest and understanding, the University partners enriched the material to include infographic materials, stories, jokes and working together on designs and pre-tests. When the Environmental Design course required the very expensive Computer-Aided Design (AutoCAD) software, which was not affordable, we offered tutorials of a non-propri-

etary software called SketchUp. With SketchUp, people were able to make great designs, as shown in Figure 10.

Figure 8. Certificates for Wikiwin students after completing University Science course which involved building a food Aeroponic system in the York Factory First Nation community.

(a)



1.3 Fall 2023 Timetable

The table below shows the work plan of activities for everyday of the week from September 18, 2023, to December 22, 2023.

| | 9 – 10:30am | 10:30 – 10:45am | 10:45 – 12pm (Noon) | 12 – 1pm | 1 – 3pm | 3 – 3:15pm | 3:15 – 5pm | 6 – 7pm | Total Hours |
|---|---|---|---|---|---|---|---|---|---|
| Monday | EVDS 1600 Tutorial | Short break on site | EVDS 1600 Tutorial | Lunch break | Work on site* | Short break on site | • Work on site* • Cleanup site | - | 7 |
| Tuesday | Work on site* | Short break on site | Work on site* | Lunch break | Work on site* | Short break on site | • Work on site* • Cleanup site | - | 7 |
| Wednesday | Work on site* | Short break on site | Work on site* | Lunch break | Work on site* | Short break on site | • Work on site* • Cleanup site | EVDS 1600 Workshop | 7 |
| Thursday | EVDS 1600 Tutorial | Short break on site | EVDS 1600 Tutorial | Lunch break | EVDS 1600 Workshop – SketchUp Tutorial | Short break on site | • Work on site* • Cleanup site | - | 7 |
| Friday | Work on site* | Short break on site | Work on site* | Lunch break | Work on site* | Short break on site | • Work on site* • Cleanup site | - | 7 |
| | | | | | | | | Total Hours | 35 |

(b)

Figure 9. (a) Wikiwin students taking the University of Manitoba two-eyed seeing and land-based education science courses and other courses in York Landing. (b) Schedule for school tutorial, classes and internships for Wikiwin students.

Figure 10. House design drawn by a Wikiwin student from York Factory First Nation for a University course.

Many students became proficient at SketchUp. One student sold their 3D objects afterwards. The students really enjoyed this hands-on learning where we worked together on designs. The quote from one student below about Wikiwin's extra workshops put in place:

"Recently, we started using a program to render a 3D model of a house or design that you've been thinking of. Also, in the program, we were able to have all the dimensions visible for everything, so that you can scale your house down to the inch as you want it. And that was a pretty good workshop, first time doing something like that" (Wikiwin student a).

Wikiwin students mentioned many positive outcomes of the Wikiwin program, including the work internships. Wikiwin students liked: "teamwork", "bonding with others", "building a house from the ground up" and "hands-on experience". After accomplishing home renovations, Wikiwin students took on increasingly complex building projects, which one Wikiwin student describes:

"Our first couple of weeks' work all we did was renovations up and down the reserves. Learning how to drywall and rewire some of the wires in my house. And some of the plumbing and some of the vents. From there, we started building a house as soon as it started warming up, and we were able to dig. We had a foundation dug out down by the six-plex on one side of the town. And we started building from there" (Wikiwin student b).

Wikiwin students learned how to plan and organize work from instructors and contractors, according to one student's statement below:

We have been learning a lot to build a house. We took maybe two months to put up a house ourselves, and we had some contractors come in and put one up in about two weeks, which gave us an idea of what we should be doing and planning for." (Eco-Health Learning Circle, 2024).

The YFFN newsletter in June 2025 from the YFFN chief and council spoke about the significance of the Wikiwin community education. The chief and council shared that Wikiwin Polytechnic Institute, which is the trades school being built, represents "bringing education home" and "self-determination" right "here on our land", stating:

"As we honour your (graduate) achievements, we are also reminded of our collective vision to Bring Education Home. The establishment of the Wikiwin Polytechnic Institute is a bold step in that direction, creating opportunities for lifelong learning, self-determination and Mino Pimatisiwin right here on our land" (YFFN Chief and Council, 2025).

Bringing education home will allow students to pursue their educational dreams of being engineers, architects and apprentice as building trades people. However, all apprenticeship programs require apprentices to have grade 12. Thus, these university courses are being registered as grade 12 equivalent courses. The first trades course to run at the Wikiwin Polytechnic Institute is in 2026. A Construction Labourer Certificate is planned for spring 2026 with a curriculum leased from the Manitoba Institute for Trades and Technology (MITT).

Wikiwin is a symbol of bringing education home. The community is proud to regain control over its education to increase access, skills and cultural integrity. The intention and plans are listed to hold apprenticeship courses in 2027 and continue with university courses. The program invites all to apply, removing the barriers for trades education and post-secondary education.

### 3.4. Financial Assets

Financial assets are the earnings, money, credit access, financial security and financial entitlements from governments. The YFFN community has low incomes, shaped by high unemployment rates (11%) and low employment rates (27%) stemming from being a remote Indigenous community, without market access (Statistics Canada, 2021b; Melvin, 2023; Statistics Canada, 2025). This low employment rate reveals a huge untapped potential for employment expansion (Indspire, 2023).

Prior to Wikiwin, most Wikiwin students were unemployed. **Figure 11** shows that pre-Wikiwin students (69%) had no work income with 50% having government income sources only and 19%, no source of income. Only one-quarter (25%) had full-time (greater than 30 hours) employment income and 6% had a seasonal job. The median income was $8,800, despite most Wikiwin students having several children to raise. Most (65%) Wikiwin students had children, typically more than one child with one Wikiwin student having six children.

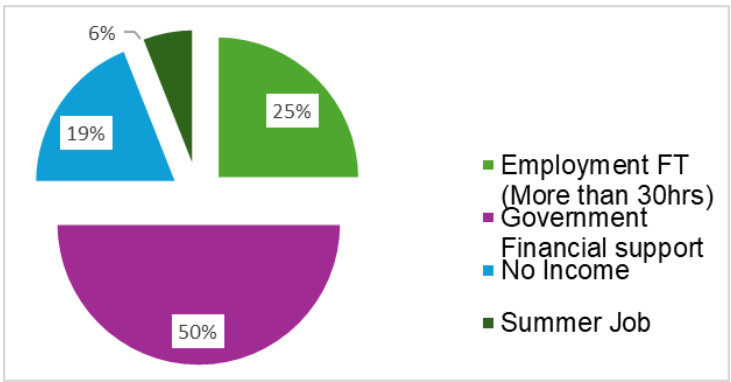



**Figure 11.** Income sources for pre- Wikiwin (n = 20) and post-Wikiwin (n = 17) students.

The Wikiwin student's income were low before Wikiwin. The pre-survey showed Wikiwin students' median income was lower than those of Indigenous people on reserves at $32,000 (aged 25 - 64). Further, pre-Wikiwin students' median income was less than half that of non-Indigenous Canadians (aged 26 - 64), with an income of $50,400 (Indigenous Services Canada, 2023). The Wikiwin students were required to work 35 hours per week on housing and attend classes to receive the stipend, being paid for full time work. Thus, Figure 11 shows post-Wikiwin with 100% of Wikiwin students having fulltime employment.

Wikiwin students' financial assets benefited from the Wikiwin an earn-as-you-learn program. The development corporation of YFFN partnered with Dr. Thompson as academic supervisor to quadruple their training funds through the MITACS. Each Wikiwin student was paid $30,000/year internship stipend through this YFFN partnership with University of Manitoba and MITACS. The median income after Wikiwin was $43,680 annually in 2025. Many worked extra hours, up to 12 or 16 hours per day, in construction to build houses in their YFFN community. The Wikiwin students were slightly higher than the median average income for Indigenous and non-Indigenous Canadians. This higher income is needed to match the higher costs to live in Northern Manitoba and the long work hours. This high income explains the statistically significant increase in Wikiwin students' satisfaction with personal and household income and satisfaction to pay necessities. Many Wikiwin students held other jobs, such as security or carpentry work, in addition to their eight-hour Wikiwin homebuilding job.

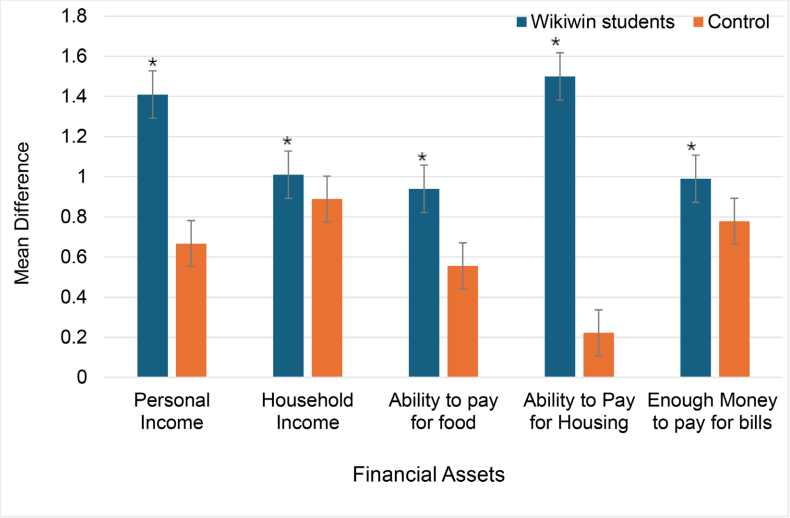



Figure 12. Financial assets satisfaction level change pre- and post-Wikiwin partnership for Wikiwin students and the control group. Legend: * statistically significant at $p < 0.05$ for paired t-test for Wikiwin cohort and control group.

The Wikiwin student financial assets improved post-Wikiwin. Figure 12 shows that the increases in satisfaction were higher for the Wikiwin student cohort compared to the control group ($p < 0.05$) for all factors. Wikiwin students statistically significantly increase in income satisfaction (MD = 1.4, $p < 0.05$), household in-

comes (MD = 1, $p < 0.05$), ability to pay for food (MD = 0.9, $p < 0.05$), housing (MD = 1.5, $p < 0.05$) and bills (MD = 1, $p < 0.05$), but no significant increase in savings. The greater financial satisfaction appear to be driven by Wikiwin internships, as Wikiwin students received a stipend of $2500/month.

See Table 3 to see that the control group was generally lower in the pre-survey than Wikiwin students. Construction is one of the higher paying jobs in First Nations which reflects higher incomes. The control group also increased across all assets, but at a lower rate.

Table 3. Pre- and post-Wikiwin partnership's mean difference (MD) and standard deviation (SD) for Wikiwin students and the control group for financial Assets. Legend: * Sig = statistically significant at $p < 0.05$ for paired t-test for Wikiwin and paired t-test for control group.

| Financial assets Rating on a 1-5 satisfaction scale. | Wikiwin students (n = 17) | | | | | Control group (n = 9) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Mean Pre- | Mean Post- | MD | SD | Sig. | Mean Pre- | Mean Post- | MD | SD | Sig. |
| Personal Income | 2.35 | 3.76 | 1.41 | 1.66 | 0.003* | 1.78 | 2.44 | 0.667 | 1.94 | 0.33 |
| Household Income | 2.58 | 3.59 | 1.01 | 1.28 | 0.01* | 1.67 | 2.56 | 0.889 | 1.69 | 0.15 |
| Savings | 1.88 | 1.88 | 0.000 | 1.66 | 1.0 | 1.44 | 2.22 | 0.778 | 1.20 | 0.09 |
| Ability to pay for food | 3.59 | 4.53 | 0.94 | 1.14 | 0.004* | 2.44 | 3.00 | 0.556 | 1.51 | 0.30 |
| Money Owed | 1.55 | 2.65 | 1.09 | 2.31 | 0.069 | 2.00 | 3.00 | 1.00 | 1.32 | 0.05 |
| Ability to Pay for Housing | 2.56 | 4.06 | 1.50 | 2.06 | 0.01* | 2.67 | 2.89 | 0.222 | 0.972 | 0.51 |
| Enough Money to pay for bills | 2.88 | 3.88 | 0.99 | 1.54 | 0.02* | 2.11 | 2.89 | 0.778 | 1.20 | 0.09 |

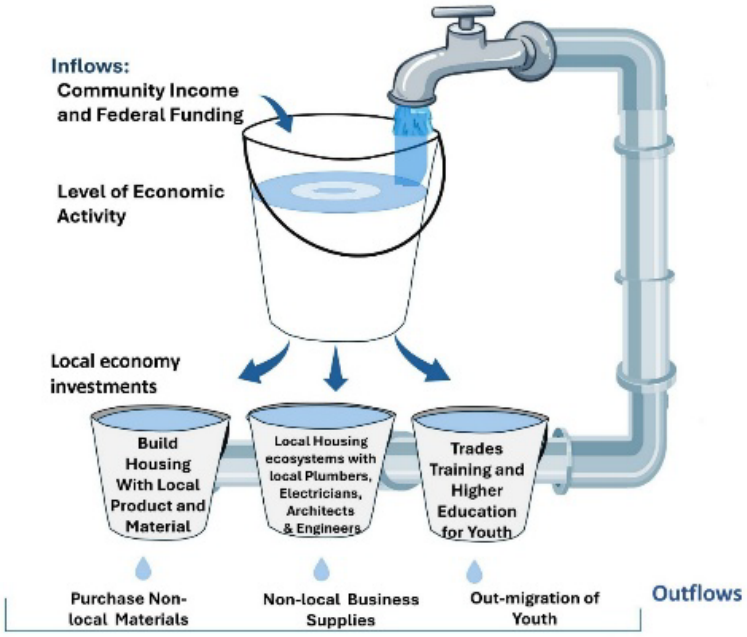



Figure 13. Higher education delivered in York Factory First Nation and houses built with local labour and supplies prevents First Nations from being a leaky bucket.

Wikiwin offered financial benefits that ripple through the YFFN community.

Figure 13 displays the economic benefits of Wikiwin "bringing education home" with education, housebuilding labour and material funding being invested in YFFN. Typically, First Nations are described as a leaky bucket as most of their funding is spent outside the First Nation due to limited retail, capacity and services. Having house-buliding and post-secondary schools in the YFFN community, YFFN retained funding and people in the YFFN community. Also, the money inflows to the community expanded through grant proposals and MITACS.

### 3.5. Physical Assets

Physical assets are the infrastructure in the community including roads, houses, grocery stores, libraries and other buildings. Infrastructure is lacking at YFFN. Without all weather roads, the youth suffer from York Landing's isolation, housing barriers, and high costs of living for groceries and other needs. The lack of housing resulted, prior to Wikiwin, in a few Wikiwin students being homeless, and the chief and many seniors having to stay at the motel, which lacked cooking facilities.

The physical capital remains limited in York Landing, despite the many builds. Without a road and the cancellation of the ferry, some large building materials could not be delivered for the last two years. As a result, the dormitory and the training centre are incomplete. The pre-/post- mean difference for Wikiwin students was not statistically significant for housing stability, library, safety in the home and grocery stores. No factor in Figure 14 was statistically significant for the Wikiwin student cohort or the control group. The lack of infrastructure without a ferry is negatively impacting YFFN's youth satisfaction with housing and other infrastructure.

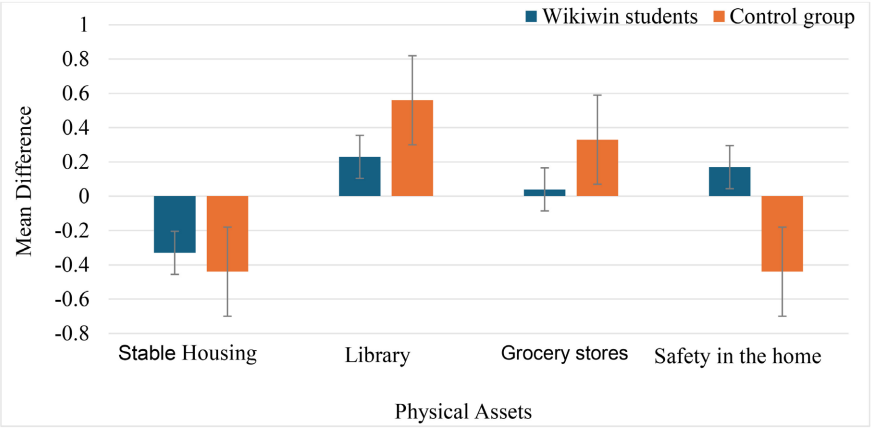



Figure 14. Physical assets satisfaction level change pre- and post-Wikiwin for Wikiwin students (paired t-test statistical result). * statistically significant at $p < 0.05$ for paired t-test for Wikiwin.

Table 4 shows that Wikiwin students started off higher than the control in their pre-survey. This difference might be explained by higher values for satisfaction of

stable housing, grocery stores and safety in the home to start. The satisfaction of the Wikiwin students was very high to start, with the control groups satisfaction being average. As the Wikiwin students had some construction skills and many were already working in housing prior to Wikiwin possibly they had already repaired their homes previously.

**Table 4.** Pre- and post-Wikiwin partnership's mean difference (MD) and paired t-test standard deviation (SD) for Wikiwin students and the Control group for physical assets. Legend: * statistically significant at $p < 0.05$ for paired t-test.

| **Physical Assets** Rating on a 1-5 satisfaction scale. | **Wikiwin students** (n = 17) | | | | | **Control group** (n = 9) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **Mean (Pre)** | **Mean (Post)** | **MD** | **SD** | **Sig.** | **Mean (Pre)** | **Mean (Post)** | **MD** | **SD** | **Sig.** |
| Stable housing | 3.74 | 3.41 | −0.33 | 2.22 | 0.55 | 2.56 | 2.11 | −0.44 | 0.88 | 0.17 |
| Library | 1.89 | 2.12 | 0.23 | 1.76 | 0.59 | 2.00 | 2.56 | 0.56 | 0.88 | 0.10 |
| Grocery stores | 2.90 | 2.94 | 0.04 | 0.97 | 0.86 | 2.33 | 2.67 | 0.33 | 1.32 | 0.47 |
| Safety in the home | 4.13 | 4.29 | 0.17 | 1.77 | 0.70 | 3.44 | 3.00 | −0.44 | 0.88 | 0.17 |

The KDC, partnering with the University of Manitoba received a successful $8.4 million funding proposal for the Canada Mortgage and Housing Corporation's (CMHC) Housing Supply Challenge: Round 3 - Northern Access (CMHC, 2023). This funding proposal received the highest award amount having met the criteria to: "reduce the time, cost, and risk to access resources for building and maintaining appropriate northern and remote housing supply". The proposal was called "Wikiwin Polytechnic Institute of York Factory First Nation: Building healthy homes with local resources". The proposal wrote about creating a housing and education ecosystem:

"The creation of a year-round trades workshop and a dormitory for student families will boost the local labour force and offer hope to York Factory First Nation and other Indigenous youth. As part of Stage 2 of the project, the project team will build the Wikiwin workshop. This will not only provide housing for homeless and underhoused students in a family dormitory but also facilitate their involvement in developing carbon-neutral home prototypes using local materials. This phase will also see the expansion of the educational curriculum in partnership with the University of Manitoba, ultimately increasing the labour force capacity of York Factory First Nation and creating more opportunities for its youth."

Wikiwin was successful in funding a housing education ecosystem at YFFN. The funding paid for local people to build a trades education centre, a dormitory to house students and four new designs for housing the instructors. This infrastructure is needed to enable the training of qualified tradespeople in northern First Nations.

Wikiwin students engaged in state-of-the art building techniques and designs. Figure 15(a) shows the passive house new design built by the Wikiwin students. The first prototype design build was funded by the stage one of CMHC rapid rural housing grant. Two other copies of this one-bedroom prototype were built by Wikiwin students in 2025.

Some big infrastructure items resulted from the Wikiwin partnership. The dormitory in Figure 15(b) has ten student dormitory rooms, each with its own bathroom, built by the Wikiwin students in 2024-2026. The dormitory is designed to have students sharing a living room and kitchen. The dormitory and the Wikiwin Polytechnic Institute were delayed due to the YFFN ferry cancellation, without a way to bring in large building materials.

(a)

(b)

Figure 15. (a) Home Wikiwin students designed and built; (b) Dormitory Wikiwin students designed and are building. Source: Mino Bimaadiziwin, 2025.

A steel building for the Wikiwin Polytechnic Institute was constructed. The shell of the steel building went up quickly with mostly Indigenous labour as shown in Figure 16. The training centre is massive at 150 × 90 feet wide × 22 feet tall. The interior work is delayed as the beam could not be delivered with the cancellation of the ferry, which is blamed on Manitoba Hydro lowering water levels on Split Lake. This steel building will provide a homebuilding workplace all year round and deliver carpentry, welding, electrical, plumbing, automotive, and culinary training.

(a)

(b)

Figure 16. Wikiwin Polytechnic Institute with (a) steel frame completed in 2024 and (b) exterior completed in 2025.

### 3.6. Social Assets

Social assets include supports and relationships from work, family, and political networks. Wikiwin improved students' social asset satisfaction as shown in Figure 17. Wikiwin students experienced a large statistically significant gain in work networks (MD = 1.7, $p < 0.05$) compared to the control group's drop, MD = −0.2.

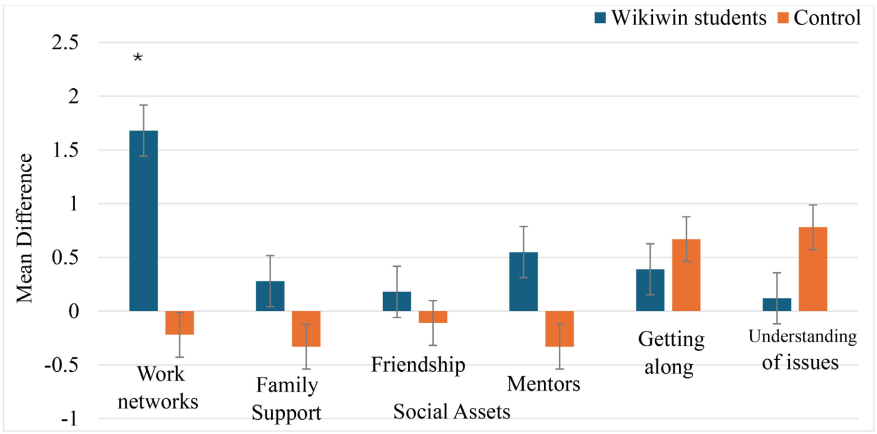



Figure 17. Social assets satisfaction level change pre- and post-Wikiwin partnership for Wikiwin students versus the control group. Legend: * statistically significant at $p < 0.05$ for paired t-test.

Table 5 shows that Wikiwin satisfaction level started at a high level, compared to the control group. The other social assets, including family support, friendships, relationships with mentors, skills in getting along with others and general understanding of issues, improved slightly (MD = 0.12 to 0.55) but not statistically

significantly. The control groups showed a slight decline in many factors, including work networks, family support, friendships and mentors, with good improvement in getting along with others and understanding of issues.

**Table 5.** Pre- and post-Wikiwin partnership's mean difference (MD) and standard deviation (SD) for Wikiwin students and the Control group for Social Assets. * Sig = statistically significant at $p < 0.05$ for paired t-test for Wikiwin and paired t-test for control group.

| Social assets Rating on a 1 - 5 satisfaction scale. | Wikiwin students (n = 17) | | | | | Control group (n = 9) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **Mean (Pre)** | **Mean (Post)** | **MD** | **SD** | **Sig.** | **Mean (Pre)** | **Mean (Post)** | **MD** | **SD** | **Sig.** |
| Work networks | 1.68 | 3.35 | 1.68 | 1.69 | 0.001** | 2.78 | 2.56 | −0.22 | 1.09 | 0.56 |
| Family support | 3.31 | 3.59 | 0.28 | 1.25 | 0.37 | 3.11 | 2.78 | −0.33 | 0.71 | 0.20 |
| Friendships | 3.17 | 3.35 | 0.18 | 1.34 | 0.59 | 3.00 | 2.89 | −0.11 | 1.17 | 0.78 |
| Relationship with mentors | 3.50 | 4.05 | 0.55 | 1.17 | 0.07 | 3.33 | 3.00 | −0.33 | 1.5 | 0.52 |
| Skills in getting along with others | 3.61 | 4.00 | 0.39 | 1.08 | 0.15 | 2.11 | 2.78 | 0.67 | 1.73 | 0.28 |
| General understanding of issues | 3.59 | 3.71 | 0.12 | 0.60 | 0.43 | 2.00 | 2.78 | 0.78 | 1.48 | 0.15 |

Wikiwin students commented about many social aspects. Wikiwin students experienced personal growth and support, commenting about how the students received "support during learning". Wikiwin nurtured a sense of community and belonging, with students saying "teamwork" and "getting to know people" were important benefits of the program. Wikiwin participants valued the support, teamwork and learning environment.

## 4. Conclusion

This study evaluated the Wikiwin program for student and community benefit. This community-led partnership between York Factory First Nation and the University of Manitoba was designed to address the housing and education crises in YFFN and was able to transform these systems. The Wikiwin-University partnership brought education home to YFFN by accessing more resources, expertise and educational programming. Wikiwin benefited both participating students and YFFN.

Wikiwin students benefited in many ways. The longitudinal survey of Wikiwin students showed what a difference Wikiwin is making to increase sustainable livelihoods of the Wikiwin student. Using a longitudinal survey with a paired t-test design, the study found that the program statistically significantly improved the human, financial, and social assets of the Wikiwin student for an in-group analysis, despite the small sample size (n = 17). This statistical significance shows the power of the intervention and the t-test approach.

This study has limitations from its small sample size. The conclusions of positive impact are drawn from very small samples, particularly the control group which had only nine participants (n = 9) complete the post-survey. This small size

severely limits the statistical power of any analysis and makes the findings highly susceptible to outlier effects. Although no outliers were evident, generalizing from such a small cohort is not possible. Thus, we will consider this as a case study, along with other examples that is creating a growing body of evidence showing the efficacy of community-led education partnerships on housing.

The YFFN community benefited from the Wikiwin program. Major infrastructure projects were built as a result of the Wikiwin partners funding proposal efforts. The University of Manitoba written proposal for the $8.4 million grant competition resulted in lots of investment in the YFFN community. This funding built a state-of-the-art trades school building, four prototype housing designs, and dormitory facilities for YFFN. This funding and local labour effectively built the infrastructure for an education ecosystem to house trades programming, instructors and students. The housing prototypes will be instructor and family student residences. The plan for this training centre is to provide trades education to the region, providing rooms for non-YFFN students in the dormitory. As well as the education system, housing is changing.

Wikiwin is transforming the housing ecosystem. Wikiwin provided new designs and building capacity. These new designs are sustainable and fire resilient using helical piles, passive solar, stone wool insulation board and metal roofing/cladding/beams. Also, the large workshop in the Wikiwin Polytechnic Institute is equipped to be used for the YFFN's housing industry to work year-round inside to produce parts for housing, such as structural-insulated panels for high performance buildings. Further, the workshop is designed large enough to provide ready-to-move housing to market to other northern communities. Figure 18 shows that Wikiwin benefits accrue both to Wikiwin student and the YFFN community.

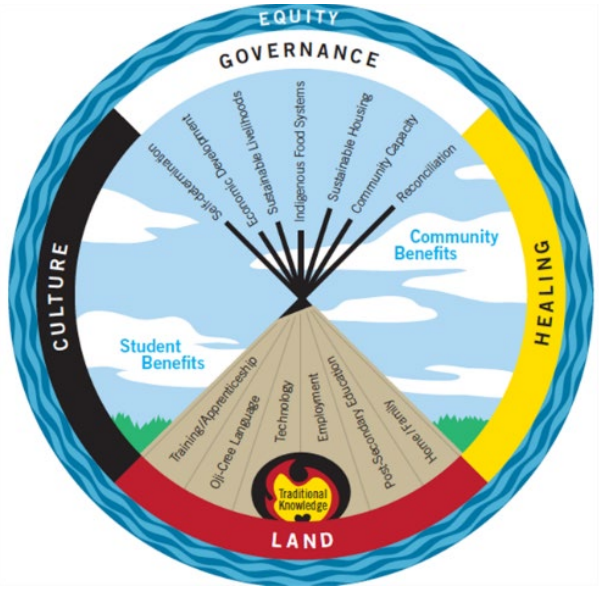



Figure 18. The community-student benefits of bringing education home applicable to Wikiwin.

The Wikiwin partnership has been highly successful at building an education and housing ecosystem for YFFN. This success is despite the state of emergency situation of this roadless remote community with its ferry cancelled for most of 2024 and 2025. The shell of the steel Wikiwin Polytechnic Institute and dormitory were finished in 2024. However, the interior is delayed by a year due to not having an all weather road or ferry. Also, delivering the university courses was delayed due to no road access in summer 2025, as the ferry was cancelled. Thus, external infrastructure failures (e.g., ferry cancellations), with the lack of road and short runway for planes limiting access created major problems. The lack of statistical significance for physical infrastructure improvements indicates the need for larger changes of a road.

The community leadership of Wikiwin was able to circumvent most problems caused by the ferry cancellation to make the education and building program workable. For example, the community arranged for us to fly-out with a cargo plane when the weather was too rough for passenger planes. Further, a small fishing boat was charted for us when the ferry did not work and to bring in small loads of materials. The Wikiwin success, despite huge obstacles, shows the power of community-led education programs to build capacity and bring resources to help resolve community issues. The university partnership brought needed expertise, funding, proposal writing skills, and education resources.

A community-led education partnership for post-secondary education benefitted YFFN students and community. This model offered a pathway that advances human, social, and economic development for the YFFN community. These findings align with other literature showing community-led homebuilding education interventions in First Nations are highly effective in building capacity and infrastructure (Hudson & Vodden, 2020; Oni et al., 2023; Reed & Diver, 2023). For example, the homebuilder program in Wasagamack and Garden Hill First Nations (Oni et al., 2023). However, this work is not alone. The body of evidence on community-led homebuilding programs shows the many benefits for students and community, offering a pathway to build First nation capacity to fill the gap of 150,000+ homes in First Nation communities.

This research analyzing a community-academic partnership for designing and building homes and home education programs contributes to the current literature on First Nations solutions to housing issues. To reconcile the housing crisis, an Indigenous, human "rights-based approach" is the recommended foundation of the First Nation housing strategy (AFN, 2020), which would be assisted by community capacity building. Clearly, Indigenous peoples right to determine and develop priorities and strategies for housing should be recognized and implemented (AFN, 2020; UN, 2023). The community-academic partnership offers one such strategy for Indigenous people's right to quality housing and education.

## Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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