

# Digital literacy in Canadian deaf signing communities: Insights from American Sign Language and Langue des signes québécoise signers

June 2025

S i l e n t



V o i c e



Resource Development Services

## Abstract

As the world pivots online, digital literacy skills are increasingly required for citizens to access governmental services, hold employment, and participate in their communities. As a marginalized group, deaf people who use American Sign Language (ASL) and Langue des signes québécoise (LSQ) experience inequalities in using technology and navigating an online world. Building on concise literature on deaf Canadians' lived experiences and literacy skills, the study will present demographic and thematic data of 83 deaf ASL and LSQ signers in seven Canadian provinces. Five major themes influencing deaf signing people's digital literacy were identified in the following areas: technology use, accessibility, information sources, social connections, and personal safety. The paper also discusses the creation of new digital resources in sign languages.

## Authors

Ley Bergeron, Leneshia Hall, Caroline Hould & Rose Etheridge.

## Citation

Bergeron, L., Hall, L., Hould, C. & Etheridge, R. (2025, June). *Digital literacy in Canadian deaf signing communities: Insights from American Sign Language and Langue des signes québécoise signers*. Silent Voice Canada Resource Development Services.

# Introduction

The world is increasingly online, meaning digital literacy is required for any Canadian to participate in society through employment, government services, and civil discourses, to name a few. Digital literacy can mean using technology for online activities, protecting their privacy, practising cybersecurity, and understanding digital information (Fox, 2024). However, not all Canadians have had the same opportunities to acquire fundamental digital literacy skills. Several factors contribute to digital inequity for those who experience different forms of societal marginalization based on their socioeconomic status, education, disability, age, gender, residency, and similar factors (Scanlan, 2021). As factors affecting Canadians' robust digital literacy are multi-faceted, the solutions to address these inequities are also multi-faceted.

Deaf signing people are an underrepresented and underserved group in Canada who are often clustered into the umbrella group of disability while ignoring their distinctive cultural and minority linguistic needs and wants (World Federation of the Deaf, 2018; Kusters et al., 2017; Bauman and Murray, 2014; Ladd, 2003). The report will provide concise literature on deaf signing Canadians' lived experiences and literacy skills. Next, it will present nationwide research data conducted with deaf signing people through survey questionnaires and focus groups. The data is used to inform the demographics of our participants and identify major digital literacy themes. The report will also discuss the creation, dissemination, and engagement of new digital resources in sign languages developed in conjunction with the research. The last section will summarize the findings, implications and recommendations to increase deaf signing Canadians' digital literacy skills and resilience against online harms.

# Terminology

Several key terms are frequently used in the report, and this section will provide clear definitions.

*Deaf/deaf* – a term used to describe a person who has little to no hearing and cannot understand speech by sound alone without aids (e.g., hearing aids or cochlear implants) or visual aids (e.g., lipreading). They are more likely to use sign language and identify with Deaf culture. Individuals commonly refer to themselves as capitalized ‘D’ Deaf or a lowercase ‘d’ deaf, depending on their cultural, language and identity preferences. “Hearing impaired or impairment”, “deaf-mute,” or “deaf and dumb” are inappropriate terms to describe this group of people.

*Deafened* – a term used to describe a person who lost their hearing at a later age and is likely to continue using a spoken language.

*Hard of hearing* – a term used to describe a person with residual hearing and is likely to use assistive hearing devices (e.g., hearing aids and cochlear implants). They may also identify as deaf or use sign language.

*DeafDisabled* – a term used to describe a deaf person with one or more additional disabilities, which can be physical, neurological, intellectual, medical or mental. Some individuals may refer to themselves as “Deaf-Plus.”

*DeafBlind* – a term used to describe a deaf person who is also blind or has partial vision. They are likely to use tactile sign language, primarily communicated through touch via hands, arms, shoulders or back.

*Hearing* – a term used to describe a person with full hearing ability. They frequently do not know sign languages or know about deaf people in general. Some hearing individuals use sign language, often due to their connections with deaf people through community ties or employment.

*American Sign Language (ASL)* – the sign language primarily used by deaf people in English-speaking regions of Canada and most of the United States.

*La langue des signes québécoise (LSQ; Quebec Sign Language)* – the sign language primarily used by deaf people in French-speaking regions of Canada.

*Indigenous sign languages (ISLs)* – the sign languages used by Indigenous people in different parts of Canada, such as Oneida Sign Language (the Oneida Territory, southwestern Ontario) and Inuit Sign Language (Nunavut).

*Language deprivation* – a permanent neurological and psychological condition stemming from limited or non-existent access to a natural language during the critical age period of language acquisition in early childhood. The observable symptoms include, but are not limited to, language dysfluency, cognitive deficits, emotional dysregulation and socio-behavioural issues.

## Overview of deaf experiences

There is no credible census of deaf people primarily using sign language in Canada, so it is difficult to provide an accurate number. There are different strategies for estimations and approximations, and the Canadian Association of the Deaf (CAD) typically uses the “one in ten” model used by the United States to estimate the census of people who identify as culturally and linguistically deaf among the wider deaf and hard of hearing population. Statistics Canada conducts the Canada Census every ten years, but there are issues in how the questions regarding deafness, disability, and language are phrased, as well as the accessibility of the census questionnaires. Thus, to this day, there are no valid and reliable statistics on deaf people who use sign language in Canada and the approximations that are being used come with strong disclaimers regarding the accuracy of the numbers (Canadian Association of the Deaf, 2015). As of 2025, it is estimated that approximately 400,000 culturally deaf people in Canada use sign language as their primary form of communication, based on the “one in ten” model. As such, ‘deaf signing people’ will refer to culturally deaf people who use sign language.

The Deaf community is one big umbrella group of deaf people with varied lived experiences and hearing people with connections with the deaf people. It is important to

recognize that no two deaf people are the same, as they often also have additional identities such as their race, gender, socioeconomic status, educational attainment, language use and so on (Bauman and Murray, 2014; Ladd, 2003; Padden et al., 1988). The scope of this report is limited to deaf people who use sign language, and the term 'deaf signing community/ies' will be used to refer to collective groups of deaf signing people.

A study by Chovaz, Russell and Daly (2022) on deaf Canadians' lived experiences is highly significant as it identifies the major underlying themes that shape a deaf life. The study found that deaf individuals often have negative experiences with medical, educational, employment, government and societal systems throughout their lives (Chovaz et al., 2022). The majority stems from the systematic marginalization of deaf people's cultural and minority linguistic identity, as well as their access needs. Approximately 95% of deaf people are born into hearing families, which likely means they did not have immediate access to sign language from the first day (Mitchell and Karchmer, 2004). Less than 5% of deaf people are born into deaf families, and thus frequently have full access to sign language and Deaf culture (Mitchell and Karchmer, 2004). The distinction is important because whether a deaf person has natural or limited language access often sets them up for their future life, not their hearing disability (Hall et al., 2019; Hall, 2017). In addition, several studies have also found that hearing families who learn sign language and sign with their deaf children show comparable language trajectories as deaf children of deaf families acquiring a signed language and hearing children who naturally acquire a spoken language (see Caselli et al., 2021; Hall et al., 2019; Henner et al., 2016). Deaf individuals who have had incomplete, limited or absent natural language acquisition in their early years (i.e. between the age of 0 and 5) often experience varying degrees of language deprivation. It manifests as permanent neurological changes, cognitive and linguistic deficits, and socio-behavioural issues (Gulati, 2018; Hall et al., 2017). The symptoms can be wide-ranging or specific, depending on the language-deprived individual. The observable effects include language dysfluency (e.g., grammatically incorrect sentences or only using simple sentences), reduced cognition (e.g., difficulty with abstract concepts, limited or missing Theory of Mind), and adverse behaviour (e.g., relationship problems, difficulty regulating

emotions) (Gulati, 2018). Language deprivation is rare in mainstream society but is frequently observed in deaf communities (Emmorey, 2023; Hall et al., 2019; Gulati, 2018).

Consequently, a very high percentage of deaf people born to hearing families are systematically denied an opportunity to acquire sign language in their early years due to deeply rooted societal prejudices. Deaf individuals frequently turn to sign language at older ages when it becomes evident that they are not fully accessing a spoken language or are exhibiting significant language delays. Since the critical period of natural language acquisition has passed, these deaf individuals often struggle to achieve native fluency in sign language or even in any language. A missing robust language foundation will also impact their ability to understand information, use cognitive processes, and regulate their thoughts and emotions. Therefore, it is imperative to consider the possible effects of language deprivation when working with deaf signing people.

### *Cultural and linguistic minority group*

Typically, deaf signing people are categorized as people with disabilities, but they are also members of a distinctive cultural and linguistic minority group. Existing systems, resources and services often focus on accessibility needs and fail to consider the cultural and linguistic differences that are instrumental (Hodge and Goswell, 2021). Also equally important is recognizing that deaf signing people are not a homogenous group in Canada. For instance, deaf signing people in British Columbia and Quebec do not always share the same cultural and linguistic backgrounds. ASL is dominant in Canada's English-majority regions, yet variations still exist. ASL in the Atlantic Canada provinces is strongly influenced by Maritime Sign Language (MSL), which lends to region-specific signs. Likewise, the ASL used by English-minority deaf signing people in Quebec are more likely to borrow and incorporate LSQ signs. Likewise, deaf signing newcomers bring their national sign languages to Canada and may blend their signs with ASL or LSQ as they learn the sign language.

Sign languages are complete and complex languages in their own right, equal to spoken languages. Along with sign languages, they also come with distinctive cultural, social and linguistic values that can be markedly different from mainstream values. For instance, sign language users cherish full access to information, information sharing, and shared identities (Holcomb, 2012). Many deaf signing people experience 'information deprivation,' where they are not offered natural opportunities to accumulate background knowledge or understanding of the social structures (Hauser, 2010). This phenomenon often results in deaf signing people struggling to understand the information given to them, which frequently has built-in assumptions of previous knowledge. It also often results in difficulty for deaf signing people navigating governmental systems (Hauser, 2010). Thus, deaf signing people have inherent cultural and social norms to proactively offer additional background knowledge, examples, and detailed explanations when they share new information with other deaf signers. This also often occurs in small groups or individual settings because deaf signers need to be able to dynamically adapt their linguistic output based on the recipient's ability to understand the information; a principle that can be extremely difficult to replicate in static signed interpretation and translations (Hodge & Goswell, 2021). Signed interpretations and translations are capable of making the information accessible in sign language. Still, they often cannot capture the necessary cultural, social and linguistic features that deaf signing people also require.

### *Literacy skills in deaf people*

Numerous studies have been conducted to measure literacy in deaf people, and the common prevailing finding shows that deafness is not the cause of low literacy skills. Instead, it is the low or missing language proficiency, whether signed or spoken, that is the major contributing factor behind low literacy skills in deaf people (Mayer & Trezek, 2020; Mayer & Trezek, 2018; de Feu & Chovaz, 2014; Garberoglio et al., 2013). Several studies have shown that deaf people consistently have literacy skills of a Grade 4 student, but if deaf people have additional intersectional identities, their literacy skills will often be similar to a Grade 2 student (Mayer & Trezek, 2020; Myers et al., 2010;



Luckner et al., 2006). It is shown that there are also additional factors in low literacy skills in deaf people, such as incomplete or lack of language access, socioeconomic factors, additional disabilities, educational background, and gender (Twitchell et al., 2015; Garberoglio et al., 2013). There are also possible societal factors, such as limited accessibility, linguistic and cultural marginalization, and ableism, that impact deaf signing people's literacy skills in English or French.

Persistent English or French literacy barriers in deaf signing people will affect their ability to access and comprehend digital resources created by the government or non-deaf organizations. For starters, deaf signing people uncomfortable with written English or French may not have the necessary prerequisite computer or technological skills in the first place, which will prevent them from accessing or using digital resources, such as videos, courses, or forums. Additionally, when deaf signing people have technological skills, they can still be hindered from accessing the digital resources due to the language complexity of English or French on digital platforms. According to the study by Scanlan (2021), deaf people are as likely as mainstream people to use and own technology. However, no studies have analyzed deaf signing people's comprehension of technological features and digital resources.

Thus, there is a high demand among deaf signing people for literacy and essential skills programs due to various reasons, including but not limited to incomplete education, being a newcomer, or lack of sign language access. All provinces and territories provide relevant government-funded literacy and essential skills programs in different capacities for their residents. However, not all provinces and territories offer literacy and essential skills programs that consider deaf signing people's linguistic and socio-cultural needs and wants, as well as contributing factors behind their literacy skills.

As of the writing, five provinces are known to provide literacy and essential skills programs tailored explicitly for deaf signing people. They are British Columbia, Alberta, Ontario, Quebec and Nova Scotia. All three territories—Yukon, Northwest Territories and Nunavut—and two provinces, Manitoba and Prince Edward Island, currently do not offer literacy and essential skills programs tailored for deaf signing people. Due to a lack of available information, it is unknown whether Saskatchewan, New Brunswick, and

Newfoundland and Labrador provide similar programs for deaf signing people residing in these provinces.

## Research aims

The research aims to provide insights into the unique challenges faced by deaf signing communities in their everyday technology use, digital literacy, and online civic participation. The findings can contribute to developing effective strategies and resources to address the gaps and improve the resilience of deaf signing communities.

The three major questions that the research hopes to address are:

1. How are the deaf signing people using technology in their lives?
2. What strategies do deaf signing people use when accessing and interacting with online information??
3. How does the demographic data help contextualize deaf signing people's self-reported digital literacy skills?

## Research methods

The research uses a mixed-method approach, combining quantitative and qualitative data. The quantitative data involves collecting demographic information of the deaf signing participants through a survey questionnaire. The qualitative data were compiled by conducting focus groups of deaf signing people across Canada and identifying the major themes using Guest et al. (2012)'s applied thematic analysis method.

The criteria for participation were:

1. Self-identification as deaf;
2. ASL or LSQ as a primary language; and
3. Canadian residency.

The research team aimed for a proportional representation and distribution of deaf signing people by setting a numeric range of approximate participants needed from each province and territory. The research team recruited the eligible participants through social media (e.g., Instagram and Facebook), local and regional deaf organizations and organizations working closely with deaf people, and the research team's built-in community connections through the snowballing method. The recruitment period was from July 2024 to March 2025, and we recruited 84 participants. One participant withdrew from the study. Nine participants did not complete the survey questionnaire for reasons unknown. As a result, only 74 participants are included in the demographic data and 83 in the thematic data from focus groups.

The survey questionnaire was made accessible in four languages: ASL, LSQ, English, and French (see Appendix A). Due to technological limitations, the participants can only answer in English or French. If a deaf signing participant prefers to answer in ASL or LSQ or finds the format inaccessible, an intermediary will translate their answers and complete the questionnaire. The participants will typically complete the survey questionnaire before participating in the focus group, with several participants completing it after participating in the focus group.

Eleven focus groups were held from September 2024 to March 2025. Four in-person focus groups were held in British Columbia, Ontario, Quebec, and Newfoundland and Labrador. Seven online focus groups were hosted through Zoom, a videoconferencing platform, at different times and days of the week. The same guiding discussion questions were used for all focus groups (see Appendix B). A focus group typically averaged one to one and a half hours, and the facilitation was done by the members of the research team, who are all deaf and fluent in ASL or LSQ. All focus groups were also videorecorded for data analysis purposes.

As a marginalized group, deaf signing people have a historical and systematic mistrust of institutions and research involving them due to the harms perpetrated against them. Therefore, it was essential to be as clear and transparent as possible about the research objectives, data handling, anonymization and publication of the findings. Additionally, it was crucial to obtain true and informed consent from all participants to

safeguard their rights. Thus, obtaining consent involved explaining the purpose of the research and what they will consent to, and informing them of their right to withdraw at any time twice, before the survey questionnaire and again before the focus group discussion. The participants are offered extra time and space to ask questions and clarifications before giving affirmative consent in ASL, LSQ, English, or French.

## *Data analysis*

Data analysis has two components: quantitative and qualitative.

- The quantitative component compiles the demographic data of the 74 research participants.
- The qualitative component uses applied thematic analysis method is used to identify the recurring themes derived from the focus groups, totalling 83 participants (Guest et al., 2012).

Lastly, the demographic data informs the qualitative data from the focus groups to observe patterns in participants' everyday technology use, digital literacy and online civic participation. The research team members conducted the data analysis. If required, specific statements shared by the participants are extracted, anonymized, and translated into written English or French to aid the identification of significant themes. Focus group themes were identified based on consistent repetition, typologies, analogies, transitions and comparisons observed in all eleven focus groups (Guest et al., 2012).

## **Data results**

### *Demographics*

The survey questionnaire identifies the demographics of our participants. It also offers observations on whether the research participants reflect the deaf signing communities across Canada. The purpose of the demographic data collection was to help

contextualize deaf signers' experiences shared during focus group sessions. We received genuine responses from possible participants, but not all of them continued to participate in one of the focus groups. The data from eligible participants who did not participate in focus groups were excluded from the quantitative data analysis. Only the demographics of participants who attended a focus group and gave informed consent are included, totalling 74 participants. The remaining nine participants who participated in focus groups but did not complete the survey questionnaire are excluded from the demographic data. The aggregated data on Deaf self-identification, primary language preference, length of sign language use, age and gender of research participants are outlined in Table 1.

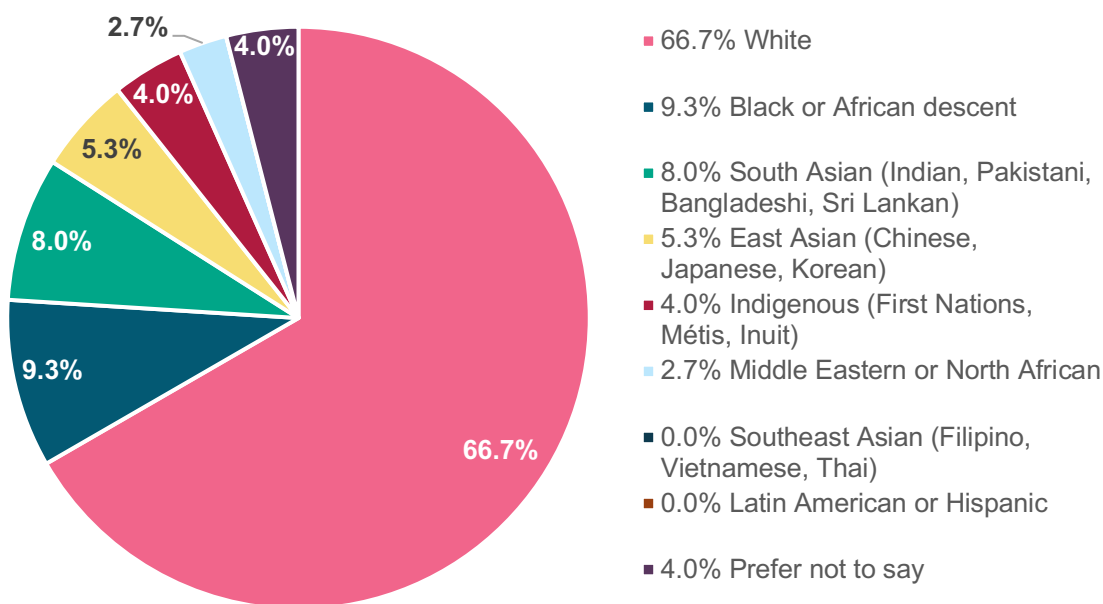
**Table 1: Aggregated demographics of research participants**

Self-identification	Primary language	Length of language use	Gender	Age
Deaf n = 69	ASL n = 56	Less than 1 year n = 1	Female n = 44	18-24 n = 4
Hard of hearing n = 4	LSQ n = 16	2-4 years n = 1	Male n = 29	25-34 n = 13
Prefer not to say n = 1	English n = 1	More than 5 years n = 72	Non-binary n = 0	35-44 n = 21
	French n = 1		Prefer not to say n = 1	45-54 n = 21
				55-64 n = 5
				65+ n = 10
<b>Total n = 74</b>	<b>Total n = 74</b>	<b>Total n = 74</b>	<b>Total n = 74</b>	<b>Total n = 74</b>

Table 1 shows that we successfully recruited eligible participants who identify as Deaf or Hard of Hearing and use ASL or LSQ as their primary language of communication. 97% of the research participants have used ASL or LSQ for over five years. There were slightly more female participants than male participants. The age of participants ranged from 18 to over 65.

The survey questionnaire also collected additional demographics such as racial or ethnic identity, education, urbanization, and province or territory of residence. The proportions of racial and ethnic identities of research participants (see Figure 1) are comparable to those of the total Canadian population from the 2021 Census (Statistics Canada, 2025).

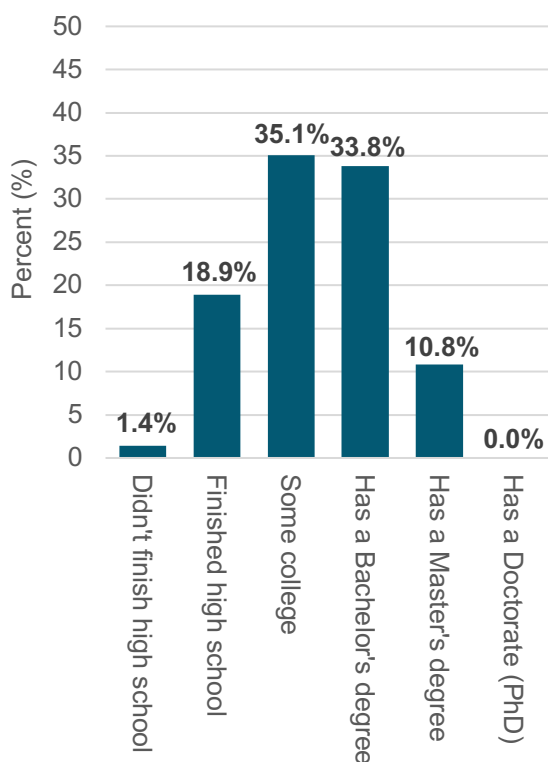
**Figure 1: Racial or ethnic identities of research participants**



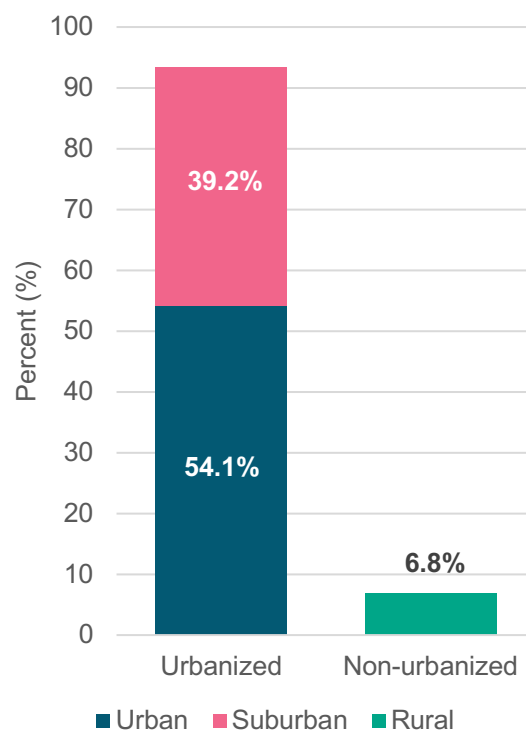
However, the educational attainment of research participants is not reflective of the general Canadian population. 44.6% of the research participants have attained a bachelor's degree or higher (see Figure 2), compared to the 2021 Census's 32.9% of the general population (Statistics Canada, 2022). It may not be reflective of the deaf population in Canada as a whole either. According to a 2023 cross-sectional study

undertaken in the United States, it was found that deaf and hard of hearing individuals are approximately half as likely to obtain a bachelor's degree or higher compared to hearing individuals (National Deaf Center, 2025). This indicates that the data may not accurately reflect the experiences of deaf signing people in Canada who have an educational attainment of some high school, a high school diploma, some college experience, or a college diploma or certificate. Equally, 93% (n = 69) of research participants reported living in urban or suburban areas (see Figure 3) compared to 88% of the general Canadian population living near the largest urban centres (Statistics Canada, 2022). A higher proportion of the research participants live in or near the urban centres, which indicates that the data also may not accurately reflect the experiences of rural deaf signing people.

**Figure 2: Highest educational attainment**

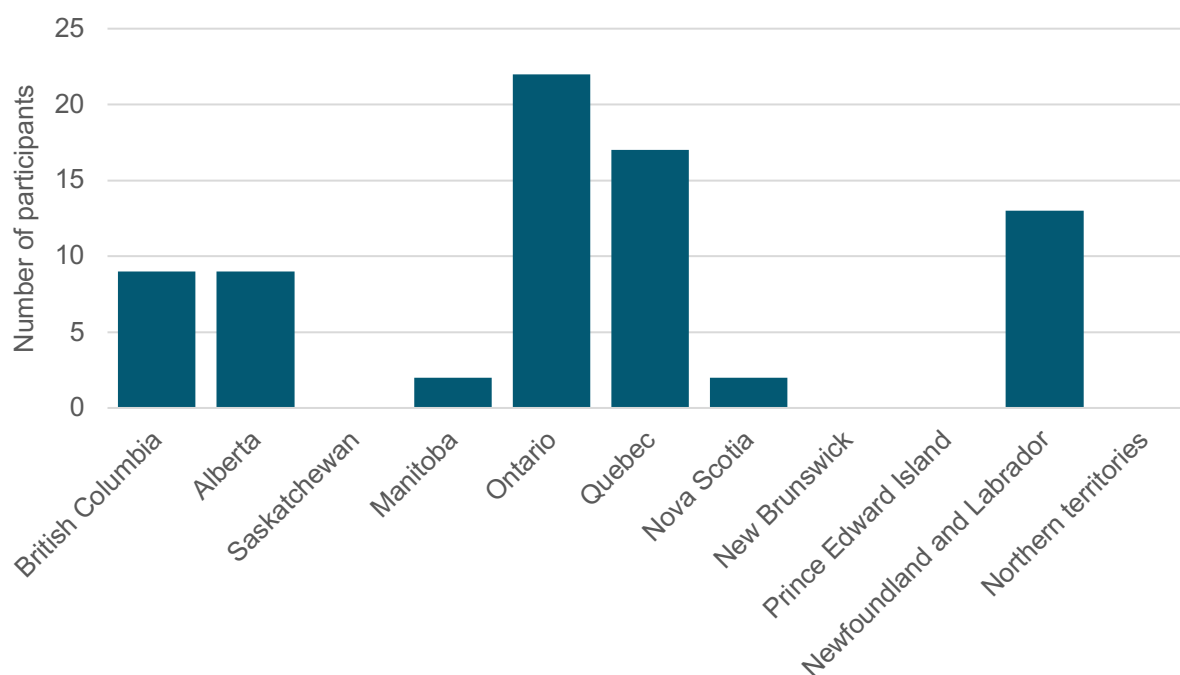


**Figure 3: Urbanization**



The research strived to collect data from deaf signing people from every Canadian province and territory. However, there were some region-specific difficulties, which meant we did not have demographic and qualitative data from the following provinces and territories: New Brunswick, Prince Edward Island, Saskatchewan, Yukon, Northwest Territories, and Nunavut. Figure 4 shows the percentage of participants, indicating which province or territory they resided in at the time of the data collection.

**Figure 4: Provincial or territorial residency of research participants**



### *Focus group themes*

Using the Guest et al. (2012) thematic analysis methods, five major themes were identified from conducting focus groups with 83 participants. The themes were determined based on repetition and consistency during the focus group and across different focus groups, as well as the use of stories, metaphors, and examples to convey the importance of the topic. The following five themes were identified: Use of technology, accessibility, information sources, social connections, and personal safety.



All research participants' supporting statements were aggregated, anonymized and translated into written English or French.

## Discussion

### *Facilitation of focus groups*

In addition to the guiding discussion questions, several facilitator observations were made while facilitating the focus groups. The observations have informed the insights that are also beneficial in understanding deaf signing people's cultural and social norms while discussing the use of digital technology or interactions with online information. For example, signing the discussion question in full was insufficient to draw responses from the focus group participants. The facilitator would frequently offer situational examples and anecdotes after asking the question so that the participants can begin to share their experiences voluntarily. Focus group participants were also more likely to actively engage during the discussions, such as visibly agreeing or lending more information to someone's narrative, thus building complex layers of shared information.

In addition, participating in a focus group was helpful for some participants, as they learned new information and digital strategies by discussing them with other participants. Other participants were more likely to make time to help another participant solve a problem, such as issues with their technological device or with a specific social media platform. It typically occurred during accessibility-related discussions, such as how to turn on closed captions on social media platforms. For many participants, focus groups were not only the place to share their experiences, but also to learn from other participants and develop a sense of belonging by recognizing their shared experiences.

### *Use of technology*

A large majority of focus group participants indicated that they are comfortable or very comfortable with technology. They shared that they typically use technological devices on a daily basis. The most common technological devices used by deaf and hard of

hearing participants are smartphones, tablets, laptops, and computers. Many participants explained that they use technological devices for personal, academic, and employment purposes. The major benefit of technology was the ease of communication with other people, both deaf and hearing, in person or online. Several participants have emphasized how vastly different their lives are with technology compared to 20 or 30 years ago, and that they saw the technological advancements as a positive impact. In addition to communication, the majority of participants also indicated they used technological devices for a wide variety of purposes, such as banking, online ordering, gaming, phone or video calls, or to search for something on the Internet. There were no observable differences between the habits of deaf signing people and the general population, except for the increased tendency to use a technological device to make in-person communication more efficient.

## *Accessibility*

One of the biggest barriers deaf signing people face when using technological devices and online information is the inaccessibility of features involving audio. All participants pointed to the pressing issue of the lack of closed captions or subtitles on online videos in spoken English or French. They also shared the concerns that automated closed captions or subtitles are often erroneous and even incomprehensible. The inaccessibility was more prominent when online information was conveyed through podcasts, which were frequently unlikely to offer written English or French transcripts. When there were videos with sign language interpreters, they were often cut off from the video frame or the camera pans away mid-sentence, leaving a deaf signer unable to follow or understand because the sign language interpreter was no longer visible.

Several participants have also raised issues about the inaccessibility of technological devices themselves, such as incompatibility with Bluetooth-enabled hearing aids or cochlear implants. Other participants have shared frustrations with the built-in software camera reaction feature (e.g., sending out a thumbs up bubble, fireworks or balloons) being automatically triggered when certain handshapes are made during signing and the difficulty with disabling the feature. Some participants indicated that they would love

to be able to personalize their accessibility preferences and experiences on technological devices and software programs instead of being offered a limited range of, or sometimes uniform, accessibility options that may not always work for them.

## *Information sources*

All participants shared the multiple ways they would access online information and find sources, ranging from using recognized news organizations such as CBC and BBC to social media posts shared by trusted community members. Many participants emphasized the importance of ensuring that the information they find is factual, and they have their preferred strategies to achieve that. Participants' most common strategies were checking multiple sources for consistency and authenticity, using different search engines, researching a specific topic to build knowledge, or talking with trusted friends or family members. Many participants increasingly identified artificial intelligence (AI) generated texts, pictures, and videos as an area of concern because it can be difficult to discern whether something was AI-generated or not.

Many participants identified the inability to read or access news on Meta platforms as an issue. The block has affected many participants' ability to access the news confidently and to understand what is happening. Some participants raised the fact that Meta's block also extended to blocking news in sign language, such as the *DailyMoth* in ASL and Radio-Canada's LSQ news, which was a significant barrier. Participants who wished to access news in sign language often used different channels (e.g., going to the source website), but these are not widely known or can be easily located. Thus, participants frequently relied on other people whom they knew to find these resources.

Several participants emphasized the issue of language proficiency in English or French. They recognized that deaf signing people have varying proficiency and confidence in written English or French, which significantly impacted their experience navigating online information. For participants who were not comfortable with written English or French, they often found written news or complex language onerous and difficult to

understand. Those participants expressed preferences for information that can be easily accessed in ASL and LSQ, but it is scarce and difficult to find.

## *Social connections*

All participants agreed they often use technological devices, apps, and social media platforms to keep in touch with people they know, such as their friends and family. They also felt a sense of community belonging through connecting with other deaf signing people and discussing common deaf community or deaf-related topics. There are dedicated groups, profiles, and pages where deaf signing people can visit, gather news or participate in conversations. However, these spaces were typically only accessible if a deaf signing person had a social media account. Several participants expressed a strong preference for in-person gatherings and events as a way of building their community connections, so they often used online information to find details (i.e. date, time and location) for these events.

At the same time, participants have also shared the pitfalls of social media platforms for social connections. More than half of the participants brought up cyberbullying as one of the major issues facing the deaf signing community. Many participants expressed their discomfort with being exposed to hateful or unsupportive comments made by someone online, whether inside or outside their community. Participants also felt that online users who create unsafe spaces or leave hateful comments do not fully understand the impact of their actions on someone who is on the receiving end because they were “hiding behind the screen.” Many participants emphasized the need to establish their boundaries and enforce the culture of respect and empathy online and offline, but participants offer differing opinions on how this can be encouraged.

## *Personal safety*

The majority of the participants practice varying degrees of online personal safety. The participants offered different examples and strategies they undertake to ensure that their information is protected online, such as not reusing passwords, enabling two-step

verification, not storing saved credit card information on phones, and not immediately trusting every email that arrives in their inbox. Several participants have shared that they have previously encountered financial or romance scams. Other participants also shared that they are very aware of the dangers of financial and romance scams and phishing through community information sharing. Participants often had varying levels of privacy that they were comfortable with online, ranging from being open and transparent with their lives to not disclosing their full legal names online. They also demonstrated varying degrees of confidence in safely maintaining their personal identifying information online. However, many participants were concerned about the inability to protect themselves after large-scale hacks or data leaks securely.

### *Important considerations*

Focus group participants as a whole are highly educated, which may not necessarily be reflective of the deaf signing community in Canada. As the demographic data shows, 44.6% of the participants hold a bachelor's degree or higher, compared to 32.9% of the Canadian population (Statistics Canada, 2022). Additionally, the National Deaf Center's cross-sectional study in 2023 shows that deaf and hard of hearing people are half as likely as hearing people to obtain a bachelor's degree or higher (National Deaf Center, 2025). Based on the National Deaf Center's study findings, hypothetically, around 17% of deaf signing community members would hold a bachelor's degree or higher. Thus, the qualitative data collected from the focus groups are strongly skewed based on the participants' educational experiences. It is likely that the themes identified through focus group discussions are contextualized by the participants' educational backgrounds. The digital literacy experiences of deaf signers who do not hold a bachelor's degree or higher are technically invisible in this study.

In an effort to shine a light on the said invisible data, three deaf professionals were recruited to share their experiences and insights based on their interactions with deaf signing people through their previous and current employment in the non-profit sector serving underrepresented deaf and hard of hearing clients. All three professionals identified themselves as deaf or hard of hearing and also fluent ASL signers. From their

experiences, language deprivation was identified as the major common theme. As Gulati (2018) described, language deprivation is caused by limited or non-existent access to a natural language during the critical early years of a person's life with permanent neurological changes, cognitive deficits and socio-behavioural issues. It is prevalent among deaf people who can exhibit a wide continuum of language deprivation symptoms. Those individuals often turn to organizations that provide services and programs for deaf signing people for support and resources. Since language deprivation affects every aspect of a deaf individual's life, the barriers they face are cumulative and multi-faceted. For instance, a deaf professional working with deaf youth described the effect of language deprivation:

*"This trauma can make it extremely difficult to retain multi-step instructions. For instance, a Deaf youth might forget the third step in a four-step password reset process or become overwhelmed by a series of dropdown menus while trying to book a doctor's appointment online."*

In addition to language deprivation, three deaf professionals identified limited language proficiency in both signed and written languages as a significant barrier. Many of their clients do not have sufficient proficiency in either language to be able to navigate educational content, digital platforms or online information. The professionals also pointed to the dominance of English (and French) in digital spaces as a significant hurdle for many deaf signing individuals who are either language deprived or have low written language proficiency. Their clients often do not comprehend the online content and have difficulty navigating websites. They also often lack the necessary basic computer skills, including knowing how to use a mouse or keyboard or understanding how apps work. The effects of language deprivation and limited language proficiency can also be compounded by additional factors such as socioeconomic status and being a newcomer, which brings another layer of complexity. One professional described it as:

*"These layered challenges create a digital environment that is neither accessible nor inclusive, leaving [a deaf signing individual] at a severe disadvantage in a world that increasingly assumes digital fluency as a given."*

The insights shared by the deaf professionals working with severely underrepresented and vulnerable deaf signers help to shine a light on the difficulties in recruiting participants with more varied educational experiences. This group of potential participants may not have understood the purpose of the research study or may not have sufficient computational skills to express interest. As a consequence, it is highly likely that there was a substantial group of deaf signing people whose experiences were not captured in the research study. These insights are based on the inputs shared from three deaf professionals and are separate from the findings from the focus group study. It is hoped that this provides more context for the observable demographic differences between focus group participants and deaf signing communities.

## **Creation, dissemination and engagement of new resources**

### *Online Tips: Video series*

Silent Voice Canada's Resource Development Services (RDS) developed 12 ASL and 12 LSQ Deaf-centric educational videos that feature online tips, digital awareness, and key concepts. Table 2 lists the titles of videos that are freely available to the general public on the centralized e-Learning platform, 258HUB (Online Tips, 2025).

The average length of a video is two to three minutes. Each video will typically involve one to three different signers assigned to different roles. ASL and LSQ cultural and social features are intentionally considered and embedded during the script writing, filming and video editing. The videos include the use of specific strategies that are proven to work well with deaf signing people that are informed by our previous work, such as visual graphics, sign language's spatial features, conversations between people, explicit explanations, real-life examples and roleplaying. The videos are shared on various social platforms, online newsletters, and the 258HUB website.

**Table 2: ASL and LSQ Online Tips videos**

Video	ASL/English	LSQ/French
1	CRA Text Scams	Escroqueries au texte de l'ARC
2	Phishing	Hameçonnage
3	How to Vote	Comment voter
4	Misinformation	Mésinformation
5	Disinformation	Désinformation
6	Online Bullying	Harcèlement en ligne
7	How to Avoid Rental Scams	Comment éviter les arnaques de location
8	Is Your Social Media Ready for Jobs?	Vos réseaux sociaux sont-ils prêts pour l'emploi?
9	Strong Passwords, Strong Security	Des mots de passe forts, une sécurité élevée
10	Romance Scams	Arnaques sentimentales
11	Online Bullying is a Crime	L'intimidation en ligne, c'est un crime
12	Protect Yourself with 2-Step Verification	Protégez-vous avec la vérification en 2 étapes

People consistently engaged with and interacted with the online tips video series on social media platforms. The ASL videos have a higher reach and engagement among ASL signers than the LSQ videos among LSQ signers. Out of 12 ASL videos, three stand out with higher-than-average reach and engagement. They are “Strong Passwords, Strong Security,” “Is Your Social Media Ready for Jobs?” and “CRA Text Scams.” The average reach was 2,875. They also averaged 21 shares and 36 reactions or comments. Out of 12 LSQ videos, two videos also show higher-than-average reach and engagement. They are “Hameçonnage” (Phishing) and “Comment éviter les arnaques de location” (How to Avoid Rental Scams). The average reach was 1,500, with an average of 20 shares and 16 reactions or comments.



## Online courses

As part of the digital literacy project, the RDS has developed 6 ASL and 6 LSQ online courses on 258HUB that are available without any registration requirements (Community eCourses, 2025). The online courses offer deaf-signing people opportunities to learn more complex digital concepts in an interactive, Deaf-centric way. Table 3 lists the titles of the available online courses.

**Table 3: ASL and LSQ online courses**

Course	ASL/English	LSQ/French
1	Internet Addiction	Addiction à Internet
2	Online Activism	Activisme en ligne
3	Cyber Safety for Adults	La cybersécurité pour les adultes
4	Cyber Safety for Youth	La cybersécurité pour les jeunes
5	Data Mining	Exploration de données
6	Fact Checking	Vérification des faits

Each course can take between 15 minutes to 1 hour to complete, depending on a person's pace and comprehension skills. There are no time limits or registration requirements, so learners can leave and return to complete as often as they like. The courses are designed with specific e-learning strategies proven to work with deaf signing people. Based on the insights from the previous work, the online courses are designed for adult learners using andragogy principles and Deaf-centric principles, such as prioritizing videos in sign languages, visual graphics and interactive activities.

Online courses from the deaf signing communities had markedly less reach and engagement. Direct links to the 258HUB website were also advertised on social media platforms. On the 258HUB website, the "Fact Checking" (Vérification des faits) course page is the most viewed one with 101 views, followed by "Online Activism" (Activisme en ligne) with 37 views. The data is inconclusive in identifying or ruling out the probable

factors behind the low engagement and will benefit from an in-depth investigation in the future.

## Conclusion

Through focus group discussions, most participants demonstrated comfort and confidence with using technology in different aspects of their lives. This is consistent with the study by Scanlan (2021), which indicated that deaf and hard of hearing individuals are just as likely as hearing individuals in their technology use. It was a matter of how technology is being used that differed. For instance, deaf signing people put in more time and effort to circumvent inaccessible barriers to obtain something they want. This can look like searching for a specific news article on a topic they were interested in because the first news article they encountered was a podcast without a transcript. Likewise, deaf signing people who want to access local news may view several different online videos created by social media creators, instead of a single video from a reputable news source, because of unreliable closed captions. There are laws in effect that require the provision of closed captions on televisions, but they are not equally enforced for online video content. Despite the technological and information barriers, deaf signing people often express similar concerns regarding the spread of mis/disinformation and AI-generated content, deterioration of online civil citizenship, and the safety of their personal information.

The demographic data was used to contextualize focus group participants' experiences, which helped with the identification of five major themes: (1) use of technology, (2) accessibility, (3) information sources, (4) social connections, and (5) personal safety. At the same time, the demographic data also informed the possibility of the 'invisible data,' as well as gaps and recommendations for future research or digital initiatives.

Based on identified themes, it is evident that existing accessibility regulations need to be updated and enforced in the digital age. Currently, there is inconsistent regulation of accessible online information content or accessible features on technological devices. There is also a major need for more information content in ASL and LSQ. Currently, deaf signers wishing to access the news in ASL often visit *DailyMoth*, a United States-

based news source that disseminates news daily, or *DeafDots*, a Canada-based news source that disseminates news periodically. For deaf signers wishing to access the news in LSQ, they often will rely on even more limited sources, such as Radio-Canada's LSQ news, often disseminated by a single journalist. More digital-related content in sign languages is also needed to build digital skills and resiliency in deaf signing communities. This will help to promote increased awareness of mis/disinformation, AI-generated information, cyber safety, civil citizenship and safe online participation.

Due to the skewed educational attainment of focus group participants and the wider deaf signing community, there is a strong need for targeted research on the impacts of language deprivation and limited language proficiency on deaf signing individuals' digital literacy skills and technology use. This area of research will benefit in designing more efficient resources and support systems to build digital resiliency in deaf signing communities' most vulnerable and marginalized people.

## Acknowledgements

We acknowledge the following entities and individuals, for without them, the research and development of new digital resources would not have been possible:

Heritage Canada for the funding that made the research, development and translation of the digital resources possible.

Silent Voice Canada's Community Support Services (CSS) and Children and Youth Programs (CYP), Newfoundland and Labrador Association of the Deaf (NLAD), and Vancouver Coastal Health's Deaf Well-Being Program (WBP) for the participant recruitment efforts and support provided for focus groups.

We also thank numerous deaf community leaders and trusted individuals for developing connections and recruiting participants in all Canadian provinces and territories.

We also acknowledge Eversa's quality contribution, including their work with ASL to LSQ and English to French translations for the video series, online courses, and the research report. We also thank their support, LSQ deaf community expertise, and contributions throughout the research project.

Last but not least, we wish to acknowledge the valuable contributions of fellow Resource Development Services (RDS) colleagues on the video series and online courses: Anna Wren, Theodor Wolff, Shannon Rusnak, Rylyn Delaney, and Wanda Blackett.

## References

- 258HUB. (2025). *Community eCourses*. Retrieved 27 April 2025 from <https://258hub.ca/community-ecourses/>
- 258HUB. (2025). *Online Tips*. Retrieved 27 April 2025 from <https://258hub.ca/online-tips/>
- Bauman, H-D. L., & Murray, J. J. (Eds.). (2014). Deaf gain: Raising the stakes for human diversity. *University of Minnesota Press*.
- Canadian Association of the Deaf. (2015, July 3). *Statistics on Deaf Canadians*. Canadian Association of the Deaf. Retrieved 24 March 2025 from <https://cad-asc.ca/issues-positions/statistics-on-deaf-canadians/>
- Caselli, N., Pyers, J., & Lieberman, A.M. (2021). Deaf Children of Hearing Parents Have Age-Level Vocabulary Growth When Exposed to American Sign Language by Six Months of Age. *Journal of Pediatrics*, 232:229-236.
- Chovaz, C.J., Russell, D., & Daly, B. (2022). Lived Experiences of Deaf Canadians: What We Want You to Know! *Canadian Psychology*, 63(4):651-666.
- du Feu, M. & Chovaz, C. (2014). *Mental Health and Deafness: Professional Perspectives on Deafness; Evidence and Applications*. New York, NY: Oxford University Press.
- Emmorey, K. (2023). Ten Things You Should Know About Sign Languages. *Current Directions in Psychological Science*, 0(0), 1-8.
- Fox, B. (2024, September 25). *Digital Competency Series: Understanding Digital Literacy (DDN2-A51)*. Government of Canada. Retrieved 24 March 2025 from <https://www.cspc-efpc.gc.ca/tools/articles/understanding-digital-literacy-eng.aspx>
- Garberoglio, C.L., Cawthon, S.W., & Bond, M. (2013). Assessing English Literacy as a Predictor of Postschool Outcomes in the Lives of Deaf Individuals. *Journal of Deaf Studies and Deaf Education*, (19)1.

- Guest, G., MacQueen, K.M. & Namey, E. E. (2012). *Applied Thematic Analysis*. Sage Publications Inc.
- Gulati, S. (2018). Language deprivation syndrome. In N.S. Glickman & W.C. Hall (Eds.) *Language Deprivation and Deaf Mental Health*, p. 24-53. Routledge.
- Hall, M.L., Hall, W.C., & Caselli, N.K. (2019). Deaf children need language, not (just) speech. *First Language*, 39(4):367-395.
- Hall, W.C. (2017). What You Don't Know Can Hurt You: The Risk of Language Deprivation by Impairing Sign Language Development in Deaf Children. *Maternal and Child Health Journal*, 21:961-965.
- Hall, W.C., Levin, L.L., & Anderson, M.L. (2017). Language deprivation syndrome: a possible neurodevelopment disorder with sociocultural origins. *Social Psychiatry and Psychiatric Epidemiology*, 52:761-776.
- Hauser, P., O'Hearn, A., McKee, M., Steider, A., & Thew, D. (2010). Deaf epistemology: Deafhood and Deafness. *American Annals of the Deaf*, 154(5):486-492.
- Henner, J., Caldwell-Harris, C.L., Novogrodsky, R., & Hoffmeister, R. (2016). American Sign Language Syntax and Analogical Reasoning Skills Are Influenced by Early Acquisition and Age of Entry to Signing Schools for the Deaf. *Frontiers in Psychology*, 7:1982.
- Hodge, G. & Goswell, D. (2021). Deaf signing diversity and signed language translations. *Applied Linguistic Review*, 14(5):1045-1083.
- Holcomb, T. K. (2012). *Introduction to American Deaf Culture*. New York: Oxford University Press.
- Kusters, A., Spotti, M., Swanwick, R., & Tapio, E. (2017). Beyond languages, beyond modalities: transforming the study of semiotic repertoires. *International Journal of Multilingualism*, 14(3):219-232.
- Ladd, P. (2003). Understanding Deaf Culture: In Search of Deafhood. *Cromwell Press Ltd*.

- Luckner, J.L., Sebald, A.M., Cooney, J., Young III, J., & Muir, S.G. (2006). An Examination of the Evidence-Based Literacy Research in Deaf Education. *American Annals of the Deaf*, (150)5.
- Mayer, C. & Trezek, B.J. (2020). English Literacy Outcomes in Sign Bilingual Programs: Current State of the Knowledge. *American Annals of the Deaf*, 165(5), 560-76.
- Mayer, C. & Trezek, B.J. (2018). Literacy Outcomes in Deaf Students with Cochlear Implants: Current State of the Knowledge. *Journal of Deaf Studies and Deaf Education*, (23)1.
- National Deaf Center. (2025). *Data Dashboard*. Retrieved 27 April 2025 from <https://dashboard.nationaldeafcenter.org/>
- Scanlan, M. (2021). Reassessing the disability divide: unequal access as the world is pushed online. *Univers Access Inf Soc.*, 21(3):725-735.
- Statistics Canada. (2025). *Visible minority and population group by generation status: Canada, provinces and territories, census metropolitan areas and census agglomerations with parts*. Retrieved 27 April 2025 from <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=9810032401>
- Statistics Canada. (2022). *Focus on Geography Series, 2021 Census of Population: Canada*. Retrieved 27 April 2025 from <https://www12.statcan.gc.ca/census-recensement/2021/as-sa/fogs-spg/page.cfm?topic=11&lang=E&dguid=2021A000011124>
- Statistics Canada. (2022). *Population growth in Canada's rural areas, 2016 to 2021*. Retrieved 27 April 2025 from [https://publications.gc.ca/collections/collection\\_2022/statcan/98-200-x2021002-eng.pdf](https://publications.gc.ca/collections/collection_2022/statcan/98-200-x2021002-eng.pdf)
- Twitchell, P., Morford, J.P., & Hauser, P.C. (2015). Effects of SES on Literacy Development of Deaf Signing Bilinguals. *American Annals of the Deaf*, (159)5, 433-46.

World Federation of the Deaf. (2018, May 11). *Complementary or diametrically opposed: Situating Deaf communities within 'disability' vs 'cultural and linguistic minority' constructs*. World Federation of the Deaf. Retrieved 24 March 2025 from <https://wfdeaf.org/news/resources/11-may-2018-deaf-community-linguistic-identity-disability-position-paper/>



## Appendix A

The following questions were used in the survey questionnaire to collect demographic information on the research participants. The sensitive personal identifying data were removed before the report was written.

1. What is your primary language for communication?
  - a. ASL
  - b. LSQ
  - c. Other
  
2. What is your preferred language for written communication?
  - a. English
  - b. French
  - c. Other
  
3. What is your age group?
  - a. 18-24
  - b. 25-34
  - c. 35-44
  - d. 45-54
  - e. 55-64
  - f. 65+
  
4. What is your gender?

- a. Male
  - b. Female
  - c. Non-binary
  - d. Prefer not to say
5. What is your racial or ethnic background?
- a. Indigenous (First Nation, Métis, Inuit)
  - b. White
  - c. Black or African descent
  - d. East Asian (Chinese, Japanese, Korean)
  - e. Southeast Asian (Filipino, Vietnamese, Thai)
  - f. South Asian (Indian, Pakistani, Bangladeshi, Sri Lankan)
  - g. Middle Eastern or North African
  - h. Latin American or Hispanic
  - i. Prefer not to say
  - j. Other
6. What is your highest level of education?
- a. Didn't finish high school
  - b. Finished high school
  - c. Some college
  - d. Has a Bachelor's degree
  - e. Has a Master's degree

- f. Has a Doctorate (PhD)
  - g. Other
7. Where in Canada do you live? (Province/Territory, City/Town)
- a. *Write-in*
8. What of the following best describes the area you live in?
- a. Urban
  - b. Suburban
  - c. Rural
9. Do you identify as Deaf or Hard of Hearing?
- a. Deaf
  - b. Hard of Hearing
  - c. Prefer not to say
10. How long have you been using sign language?
- a. Less than 1 year
  - b. 2-4 years
  - c. 5+ years
11. Have you participated in a focus group before?
- a. Yes

b. No

12. Are you comfortable discussing your experiences and opinions in a group setting?

a. Yes

b. No

13. Are you able to participate in the focus group?

a. In-person only

b. Zoom only

c. In-person or Zoom

## Appendix B

A list of guiding discussion questions was used to facilitate a focus group. The questions were made available in two channels: ASL/English and LSQ/French. They were shared with the participants before the focus group and repeated during the discussion.

### Use of Technology

1. On a scale from 1 to 10, where 1 is not comfortable at all and 10 is very comfortable, how comfortable are you with using phones, tablets (like iPads), laptops or computers?
2. What do you usually use your phone, tablet (like iPad), laptop or computer for? For example, to talk to people, find information or get directions.
  - a. When you use your phone, tablet (like iPad), laptop or computer, is it easy? If hard, why?
3. What problems do you face when trying to use your phone, tablet (like iPad), laptop or computer? Is anything not accessible for you to use?

### Understanding Information/News

1. Where do you go first when you need to find information online?
2. What do you do if you can't find the information you need online?
3. When you read news or information online, how do you know if it's true or not? How do you know if it might be wrong?
4. Do you use social media (like Facebook or Instagram) to find information or news? If yes, why do you use it?
5. Is the Internet easy for you to use when looking for information or news? For example, can you find information in sign language, use captions on videos or get text that is easy to read?

### Online Social Interactions

1. How sure are you that you can keep your personal information (like your name, password, birthdate or credit card) safe online?
2. Do you take part in online groups or communities (for example, groups for people with the same interests)?
  - a. Have you had any problems with online groups? For example, they are not accessible, not respectful or not safe. You can give a simple answer if you are not comfortable sharing what happened to you.
3. What makes it hard for you to protect yourself online or to be part of a positive (good) online community?