Technology Access in Public Libraries:

Outcomes and Impacts for Ontario Communities

Nordicity

Contents

The Vision

"Every Ontarian has convenient, local access to the technology they want and need, and the comfort and confidence to use it, so that they can access economic, educational, social, health and civic opportunities to achieve prosperity, advancement and overall well-being."

Bridge Technology Services Assessment Toolkit *(Bridge)* enables public libraries to deliver on this vision by:

Building on the collective capacity of Ontario public libraries to **deliver services that are responsive** to rapidly changing technology and to the unique needs of their communities;

Providing **evidence of the value and impact** of that investment;

Contributing to a more accurate and complete picture of how technology services fulfill the mandate of public libraries to deliver **effective and efficient services**;

Enabling libraries to understand and demonstrate how technology services **directly benefit residents of their communities**, particularly the most marginalized and highest need customers, and how these services align with the priorities of government, business and social services.

Introduction

In July 2016, Toronto Public Library (TPL) engaged Nordicity to develop a suite of resources designed to support public libraries across Ontario in the provision of technology services. The outcome of this project is the **Bridge Technology Services Assessment Toolkit (*Bridge*).**

The Project Summary presents an overview of the pilot implementation of the *Bridge* toolkit along with a selection of key findings from the participating public libraries. It explores the value of technology services that participating libraries provide to the public and outlines the potential impact that increased access to these services can have.

Finally, this summary presents considerations for the broader rollout of *Bridge* across Ontario public libraries. In so doing, it both documents the toolkit's current limitations and the challenges to its widespread adoption, and highlights the opportunities for libraries to positively transform the landscape for digital inclusion and digital literacy in Ontario.

This document draws on material from the *Discussion Paper and Interim Report* (June 2017) and the *Final Report on the Development and Pilot Implementation of the Bridge Technology Services Assessment Toolkit* (March 2018) to present a summary of key project findings.

Project Objectives

The aim of the *Bridge* project is to help Ontario public libraries expand the reach of the technology services that they deliver to their communities, and measure the effectiveness of those services. To that end, the **Bridge Technology Services Assessment Toolkit**, a web-based solution for gathering data, has been developed to inform decision-making on the use and outcomes of technology services offered by public library systems in Ontario.

For many Ontarians, public libraries are the primary, and often only, access point for a variety of technology resources. With their unique mandate and reach, physical and technical infrastructure, staff expertise and local community presence, public libraries play a critical role in addressing the digital divide. As shown in the figure below, public libraries across the province are providing essential technology services to millions of Ontarians each year (data shown for 2016).[1]

Digital Technology Resources in Ontario Libraries
Population 14.2 million

310 public library systems

934 public library branches

46 First Nations public libraries serving on-reserve population of 50,232

71.6 million in-person visits

104.8 million visits to library websites

20.8 million in-branch wireless sessions

165,036 digital literacy program attendees

883,950 new and emerging technology uses

2016 Ontario Public Libraries Data

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1. Prepared by Toronto Public Library, based on data from approximately 380 public libraries, First Nations public libraries and contracting organizations (available at *ontario.ca/data/ontario-public-library-statistics*)

Bridge has the potential to position the public library sector in Ontario as a leader in the advancement of outcome measurement practices for peers in other jurisdictions, as well as across the culture sector and beyond.

The Challenge and Opportunity

In today's world, social and economic participation are highly dependent on the ability of its citizenry to navigate the digital world and interact with digital information and networks. Without access to technology and the skills required to use it, individuals are at a risk of exclusion from activities and experiences that are critical to their well-being and success.

Essentially, *digital inclusion* and *digital literacy* are increasingly basic requirements for active involvement in 21st century life, be it personal, civic, social or professional.

Despite high levels of broadband and mobile penetration, connectivity gaps remain across the province, primarily driven by lack of affordability and choice. These gaps are amplified in rural or remote regions (e.g., First Nations communities) and among low-income populations. As the impact of digital technology on personal and professional development continues to permeate every aspect of life, the challenge facing communities across Ontario is their ability to provide equitable access to connectivity, current and emerging technologies, and training and support for people to fully participate in society and the economy.

Digital Inclusion: How communities and individuals access the technological capacity to pursue economic and educational opportunities, and to participate in civic life.[2]

Digital Literacy: The ability to use information and communication technologies to find, evaluate, create, and communicate information, requiring both cognitive and technical skills.[3]

2. As drawn from the Edge Initiative, Edge Website, "Edge: where people connect, communities achieve" (2016).

3. As defined by the American Library Association, ALA Connect Website, "Digital Literacy Definition" (September 14, 2012).

The Role of Public Libraries

Public libraries are already at the forefront of providing access to information and skills to people of all ages, abilities and backgrounds, on a highly localized scale. As such, they are perfectly positioned to take a leading role in addressing digital inclusion and digital literacy in their communities. Public libraries across the province provide their customers with the opportunity to connect to the Internet and use equipment ranging from desktop computers to 3D printers. As welcoming community hubs for both self-directed discovery and structured learning, libraries also support the development of digital comfort and skills.

In addition to contributing to these basic requirements for participation in the digital world, public libraries support the full spectrum of social and economic applications of current and emerging technologies. From a social perspective, the range of technology services at public libraries enables people of all ages to connect with friends online and to access news, current events and digital government services, all of which supports civic engagement and democracy.

Public libraries also provide both one-on-one support as well as structured classes on how to interact with, understand, and evaluate this information.

From an economic perspective, public libraries help to drive competitiveness and innovation by providing access to new and emerging technology services such as virtual reality tools, design hardware and software, coding classes and audio-visual recording equipment. In this way, public libraries encourage both creative expression and entrepreneurial experimentation. Existing businesses can use the range of technology services at libraries to connect with potential customers, partners or investors, or access the information they need to better understand their markets. Individuals, on the other hand, can keep their skills up to date by engaging in lifelong learning through digital learning platforms (e.g., Lynda.com) or through structured technology training courses offered by libraries.

Actionable Data to Match Library Technology Services to (Evolving) Community Needs

Technology services are rapidly becoming more sophisticated and varied, and public libraries continue to adapt to evolving ways of learning, creating and interacting with information. At the same time, the needs of each community in Ontario are vastly different. To develop responsive technology services, public libraries must plan services with their specific communities' needs in mind, track the delivery and update of those services and consult customers on their experiences.

Each step of this service delivery process should be driven by evidence. To achieve this, libraries must have access to current, reliable and actionable data, such as participation rates in technology training programs, or feedback from customers on the activities they engage in through the available technology services at their local branch. A framework for measurement and evaluation enables informed decision-making, and easy-to-implement tools allow public library systems of all sizes and resource capacities to use data and customer feedback to better meet the specific needs of their communities.

A consistent, widely adopted approach also has the added benefit of comparability – public library systems would be able to track changes in performance over time and benchmark their technology services to those delivered by their peers across the province. Finally, access to reliable, timely and relevant data helps demonstrate the value of investments in technology to stakeholders.

The Solution

Bridge Technology Services Assessment Toolkit

To support Ontario public libraries' ability to deliver technology services more efficiently and with greater impact, Nordicity, working closely in collaboration with TPL and participating libraries, has developed the Bridge Technology Services Assessment Toolkit. Developed to specifically meet the needs of Ontario public libraries, *Bridge* is a customizable web-based application for libraries to capture and analyze performance and outcome data on technology services. Using *Bridge*, library systems can measure:

- **Availability:** the volume of technology services offered, such as the number of Internet-enabled public work stations

- **Usage:** uptake of technology services by library customers, such as the number of participants in a technology training program

- **Outcomes:** the kinds of activities and results that technology services enable for library customers

- **Service delivery:** gauge how prepared frontline staff are to deliver technology services such as their ability to answer technical and other questions about the technology services they support

Library staff can use *Bridge* to view results, compare those results with previous months, and see how their library's performance compares with other Ontario public libraries.

Outcomes, Impacts and Opportunities to Close the Gaps

One of the primary objectives of the research and consultation conducted in the project was to determine outcomes that would reflect the range of technology services offered by public libraries across Ontario, and how these services benefit Ontarians.

The framework developed is two-tiered. Providing **digital inclusion** through access to technology and **digital literacy** skills training are the primary outcomes of the technology services offered by public libraries. These outcomes, in turn, enable a range of secondary outcomes, namely:

- **Community, social and civic engagement:** Increased community cohesion, and social and civic participation
- **Creativity and innovation:** Engagement in the creative process enabling self-expression, and creative and innovative content
- **Entrepreneurship and business development:** Support to start, manage, and grow small businesses which support employment
- **Workforce development:** Preparation of job-seekers for the workforce through educational activities, employment, professional development and lifelong learning opportunities

Primary Outcomes

Digital Inclusion + Digital Literacy

Secondary Outcomes

| Community, social & civic engagement | Creativity & innovation | Entrepreneurship & business development | Workforce development |
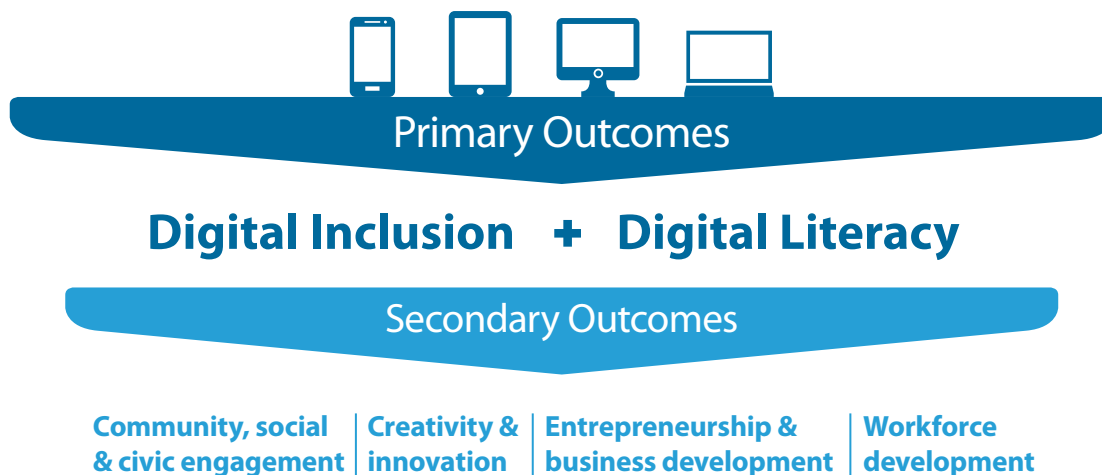
Together, these two primary and four secondary outcomes create a framework to measure and benchmark how technology access in public libraries improves the lives of residents across Ontario while advancing the broader impact of government strategies and programs. This framework serves as the structural basis of *Bridge*, allowing public libraries across Ontario to measure service performance and outcomes in each area in a way that is streamlined and comparable.

Bridge also helps libraries understand and demonstrate not only how technology services directly benefit residents of their communities, but how these services align with and support social and economic priorities at multiple levels of governments.

What We Found: Key Findings from the Pilot

The Customer Survey, generated by *Bridge* for each library system based on their suite of technology services, was made available from July 19 to October 31, 2017 to customers who had used one or more technology services at the participating library systems during that time period. In total, the eight participating libraries gathered 1,561 Customer Survey responses.
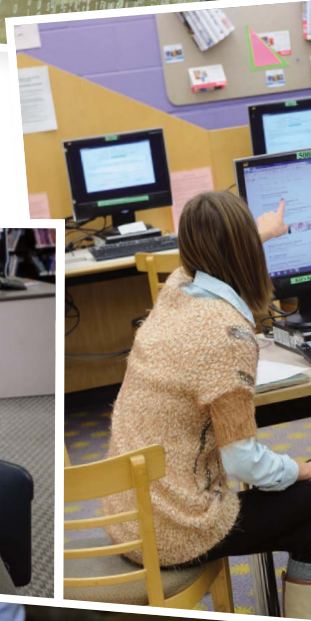
Digital Inclusion

Public libraries across the province primarily promote digital inclusion by providing Internet and computer access to customers, including Internet-connected workstations, wireless Internet at the library, and offsite access to the Internet.

The preliminary results suggest that most people who use library technology services would not otherwise have had access to at least some of that technology. More strikingly, nearly half of the customers who use technology services use it to access the Internet when they would not otherwise have been able to do so. Therefore, it appears that public libraries in Ontario make a significant contribution to bridging inequities of access to technology.

Respondents who would not have otherwise had access to technology:

56% used technology at the library

68% among older customers age 55+
63% among customers identifying as low income

46% accessed the Internet at the library

Digital Literacy

Public libraries facilitate the development of digital literacy that is critical to living and working in the digital age. Technology services at public libraries encompass drop-in or scheduled one-on-one support as well as classes designed to develop specific skills in a more structured setting. Training support services offered by libraries across Ontario range from basic computer skills and email to Internet safety to programming and coding.

Ontario public libraries not only play a role in introducing customers to new technologies, but the high rate of longer-term adoption indicates that these new technologies continue to be relevant to customers even after their initial introduction. The library environment and support provided by staff are effective in making customers comfortable with the continued use of new technology, as well as contributing to an increase in digital comfort overall.
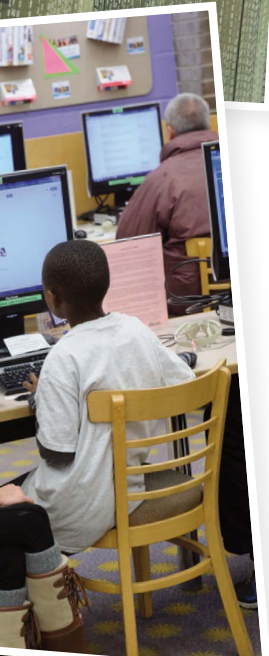
44% of respondents who used technology services were introduced to new technology

52% among older customers age 55+
92% of those introduced to new technology continued to use it

84% of respondents reported increased digital comfort after using one or more services

91% among customers identifying as a visible minority

Community, Social and Civic Engagement

The combination of Internet connectivity, access to equipment and software, and digital literacy training and support available at public libraries enables customers to establish and maintain meaningful connections, engage socially, contribute to their community and access public resources.

Activities associated with community, social and civic engagement span the full range of technology services, ranging from a high-speed Internet connection that enables social activities such as connecting with friends and family (e.g., via Skype) to training on how to search the Internet and navigate social media networks.

Even with the shift to digital, access to current news and events continues to be a major activity in public libraries, though now through the use of technology. In addition, libraries are now enabling people to connect with friends and family. As seen by this study, these activities contribute to significant increased levels of community and social engagement.

81% of respondents reported an increased level of community engagement

68% of those using technology for community engagement did so to learn about current news and events

81% of respondents reported an increased level of social engagement

34% of respondents had used technology service(s) to access online government resources

higher among older customers age 55+ and customers identifying as low income or visible minorities

Creativity and Innovation

Public libraries are at the forefront of providing cutting-edge creative tools to amateur and professional creators alike. Digital tools and supports at public libraries foster creativity and innovation, in part through enabling collaborations and introducing community members to the potential of digital tools to advance creativity and innovation.

The most common creative products made using a library technology service were multimedia and writing projects, with immigrant customers and those identifying as low income more likely to have completed a writing project. Among the respondents that reported "other" to this question, the most common product was a 3D printed project.

41% of respondents used technology service(s) to make a creative product

higher among younger customers under 34 years of age

multi-media and **writing projects** were the most common types overall

Entrepreneurship and Business Development

Digital literacy is foundational to participating in the knowledge economy. The public library's role in supporting entrepreneurship extends beyond basic digital skills training. Much support is available at libraries where staff direct customers to appropriate business-related resources and help them navigate regulatory requirements online. Some public libraries also run programs that target business skills, many of which incorporate technology services including on-site business resources and virtual business resources. Public libraries also provide access to work spaces, which have the potential to spark networking and collaborations among the small businesses and entrepreneurs that use library services to start, manage or expand their businesses.

26% of respondents used technology service(s) to start, manage or grow their business

93% of these businesses employed fewer than 20 employees

Workforce Development

In addition to providing opportunities for customers to learn *about* technology (i.e., digital literacy), public libraries allow customers to learn *through* technology. Technology services at public libraries assist people of all ages in updating their skills, finding work and excelling academically and professionally in a connected world. Public libraries contribute to workforce development, as libraries facilitate access to education and lifelong learning; the development of employable skills; and resources supporting the various stages of the job search process.

The technology access provided by the library to help customers with their job search skills resulted in employment success for almost half of the respondents.

64% of respondents used the technology service(s) for educational activities

higher among younger customers under 34 years of age, and customers identifying as immigrants or visible minorities

completing course work or **homework** were the most common types overall

45% of respondents used the technology service(s) to develop employable skills

higher among younger customers under 34 years of age, and customers identifying as a visible minority

technical skills were the most common skills developed overall

36% of respondents used the technology service(s) to develop job search skills

higher among customers identifying as low income, immigrants or visible minorities

finding information related to a job, **accessing job boards** and listings, and **resume building** were the most common skills

43% of respondents who used the technology service(s) to improve their job skills were successful in finding a job

Conclusions and Key Learnings

The *Bridge* pilot project has made significant strides toward developing a practical and relevant solution that can help Ontario public libraries understand the impact their technology services are having. In turn, it has built capacity in the participating libraries. These key learnings from the pilot project can help to inform improvements to the toolkit and its use that would make it more useful and valuable to public libraries moving forward:

3 Using *Bridge*, or any other solution that involves the gathering and interpretation of data, requires a basic level of comfort with, understanding of, and capacity to make sense of the data generated. To maximize the benefit of a tool such as *Bridge*, libraries in Ontario would need to increase their data collection and analytic capacity and skills. They would also need to incorporate these processes into their respective broader organizational workflows. As such, it is recommended that the technical rollout of *Bridge* be accompanied by a skills development program for library staff.

1 The rollout of a refined toolkit to a wider group of Ontario libraries should allow continuous improvement of the solution driven by the needs of Ontario libraries. As more data is entered into *Bridge*, further functionalities and usability features can be added to increase its effectiveness in helping libraries measure and plan their technology services.

2 It is valuable for public libraries to be able to compare the outcomes achieved by their technology services to other *Bridge* users (whether similar in size, community make-up, or geography). In time, *Bridge* will represent a variety of public library systems across the province. While this need was identified at the start of the project, the size of the pilot was not large enough to allow for the development and/or testing of more granular comparisons. It is nonetheless recommended that this feature be explored as *Bridge* continues to be developed.

4 Because nearly all participating libraries faced significant challenges collecting availability and usage statistics, there were major gaps in the completeness of data entered by libraries. While the module designed to collect this data was based on consultations with stakeholders, and saw significant changes in functionality after the first pilot, it could be further refined. It is recommended that this module be revisited after further consultations with a larger group of libraries, leveraging the learnings from this pilot.

Public libraries across Ontario strive to deliver services that are responsive to the rapidly changing technology landscape as well as the unique needs of their communities. *Bridge* improves libraries' ability to make informed, evidence-based decisions and understand how their services are being used. However, without the broad adoption of *Bridge*, the efficacy of the toolkit and libraries' collective capacity to deliver on the shared vision of digital inclusion and digital literacy for all Ontarians will be limited.

As public libraries adopt *Bridge* to more clearly identify their technology service needs and better demonstrate the value of these services, sustainable and predictable funding will also be critical to ensure adequate access to technology services across Ontario and to realize the vision of ensuring that:

Every Ontarian has convenient, local access to the technology they want and need, and the comfort and confidence to use it, so that they can access economic, educational, social, health and civic opportunities to achieve prosperity, advancement and overall well-being.

Final Report on the Development and Pilot Implementation of the Bridge Technology Services Assessment Toolkit

I. About the Project

In July 2016, Toronto Public Library (TPL) engaged Nordicity to develop a suite of resources designed to support public libraries across Ontario in the provision of technology services. The outcome of this project is the **Bridge Technology Services Assessment Toolkit** – a software-based solution for gathering and analyzing data – for libraries to easily assess the need for technology services in their communities, measure the outcomes of the technology services they deliver, and benchmark those services and outcomes against their peers across the province.

Finding the Issues

The project began with an in-depth **environmental scan,** which examined the current landscape of public libraries in Ontario in terms of the need for and delivery of a range of technology services. The environmental scan was based on consultations with stakeholders, including the Ontario Ministry of Tourism, Culture and Sport, the City of Toronto, and the public library sector, as well as secondary research. The environmental scan also included a review of prevalent measurement and evaluation practices in libraries and other relevant sectors, in Ontario and beyond. The scan highlighted current **gaps in and opportunities for improvement** in the assessment tools and methodologies available to Ontario public libraries, and their capacity to leverage these resources to understand the evolving needs of their communities for and demonstrate the value of technology services.

In turn, the findings of the environmental scan informed the development of an **Outcome Framework** to reflect how public libraries in Ontario benefit their communities by providing technology services. The two-tiered framework maps library technology services to six outcome areas, each of which includes one or more Key Performance Indicators (KPIs).

Developing the Solution

Using the Outcome Framework as an organizing principle, a customizable web-based application (*Bridge*) was designed and developed for library staff to capture and analyze performance and outcome data on their library systems' technology services.

Using *Bridge,* library systems can measure:

- **Availability:** the volume of technology services offered, such as the number of Internet-enabled public work stations

- **Usage:** uptake of technology services by library customers, such as the number of participants in a technology training program

- **Outcomes:** the kinds of activities and results that technology services enable for library customers

- **Service delivery:** gauge how prepared frontline staff are to deliver technology services such as their ability to answer technical and other questions about the technology services they support

Library staff can use *Bridge* to view results, compare those results with previous months, and see how their library's performance compares with other Ontario public libraries.

The environmental scan and key elements of the first iteration of this toolkit were summarized in a Discussion Paper and Interim Report (June 2017).[1]

Testing and Revision

Bridge was tested with users and refined through **two pilot rounds** involving a group of public library systems across Ontario.[2] Upon the completion of the second pilot, *Bridge* was **revised based on user feedback.**

Bridge will continue to be refined and iterated upon, based on the findings of this report as well as ongoing feedback from libraries to support their delivery of technology services.

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1. Full interim report available at **torontopubliclibrary.ca/bridgetoolkit**

2. The following libraries were involved in each pilot: Pilot 1 – Toronto Public Library and Innisfil ideaLab & Library; Pilot 2 – Toronto Public Library, Innisfil ideaLab & Library, Kitchener Public Library, Windsor Public Library, Mattawa Public Library, Perth & District Union Public Library, and Wikwemikong First Nation Public Library. Naotkamegwanning First Nation Public Library was also involved in the consultation process, although the library was unable to pilot *Bridge* in full due to unexpected library renovations and resource issues.

II. Overview of Pilot Implementation

Bridge was piloted in two rounds with eight public library systems across Ontario. The first pilot ran from March to May 2017 and was implemented at Toronto Public Library and Innisfil ideaLAB & Library. This pilot focused on testing the technical functionalities of *Bridge*.

The second pilot involved all eight participating libraries and ran from July to October 2017. The second pilot focused on a refined toolkit with a larger sample of libraries. In so doing it assessed the extent to which *Bridge* is relevant to libraries across Ontario, reflects the needs of the eight pilot libraries and their communities (acting as proxies for all Ontario libraries), and can effectively report on the outcome measures. This report presents findings from the second pilot.

Each pilot round began with an introductory **training session** for project leads from participating libraries. The participating libraries were also provided with an opportunity throughout the pilot to communicate with the project team and other library staff participating in the pilot via a **Slack channel,** where they could ask questions and share learnings from their library system's experience with and rollout of *Bridge.*

The training sessions and communications through Slack and via email were supplemented by **in-person site visits** by Nordicity to many of the participating libraries to gather mid-pilot feedback.

1. Project-level outcomes

Overall, library staff at the participating library systems saw immediate benefits to using the *Bridge* toolkit. There were five key project-level outcomes that library systems experienced as a result of participating in the pilot:

(A) The development of a community of practice around measurement and evaluation;

(B) An evaluative mindset and comfort with measurement and data and value of outcomes;

(C) Increased recognition among staff of the value of the technology services delivered;

(D) Better understanding of frontline service delivery; and,

(E) Increased awareness among customers of technology services.

(A) The development of a community of practice around measurement and evaluation

By participating in the pilot project, library staff had opportunities to engage in discussion with their peers around shared measurement and evaluation challenges. It was evident from the preliminary group consultations that sharing knowledge and effective practices was beneficial to participants. With Toronto Public Library as the lead, participating staff began to form a community of practice through Slack discussions (see Figure 1 below) as well as semi-structured group calls. The potential for continued knowledge-sharing among library staff is a promising project-level outcome, which could result in the ongoing, peer-based expansion and continued improvement of *Bridge* and related measurement and evaluation practices.

figure 1   Snapshot of Tech Access Pilot 2 Slack Channel, pilot2libraries.slack.com
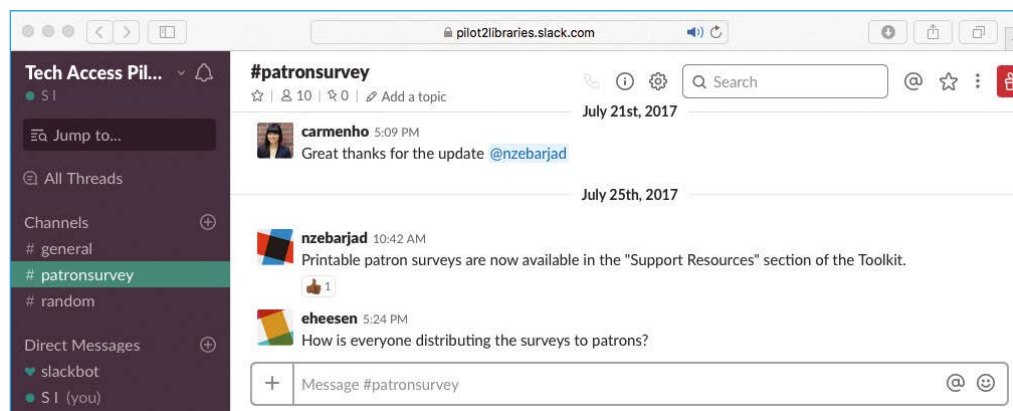
B **An evaluative mindset and comfort with measurement and data and value of outcomes**

The impetus behind the development of this toolkit was the ongoing evolution of statistics from one-dimensional measures of volume (such as attendance or sessions) to deeper analytics that generate more meaningful insights and better support decision-making. This evolution in mindset is combined with the increasing need for accountability and the related need to provide evidence that libraries are serving their communities. In particular, there is a need to illustrate the impacts felt by new service offerings and the outcomes of services for residents.

In this context, libraries are required to collect, manage and interpret data that is increasingly necessary to identify, deliver and validate their diverse service portfolios and ensure they are meeting community needs and priorities as they continue to change.

Initial consultations revealed that this type of evidence-based decision-making was not yet common at most libraries. In fact, when the interim results of this project were presented at the 2017 Ontario Library Association (OLA) Super Conference, an informal audience poll confirmed this gap (see Figure 2). Furthermore, the Super Conference poll revealed that limited resource capacity is a key inhibitor to Ontario public libraries' ability to measure the outcomes of technology services (see Figure 3).

Consultations throughout the project with participating libraries further confirmed that, despite the usefulness of *Bridge*, capacity issues limited the ability of libraries to fully take advantage of the pilot.

Nonetheless, the value of *Bridge* is that it provides libraries with the ability to engage in evidence-based decision-making with measurable outcomes and impacts. Libraries would need to address internal capacity issues as they roll out *Bridge*. However, moving forward, additional support should be provided by Toronto Public Library and, through the community of practice by other libraries using *Bridge.*
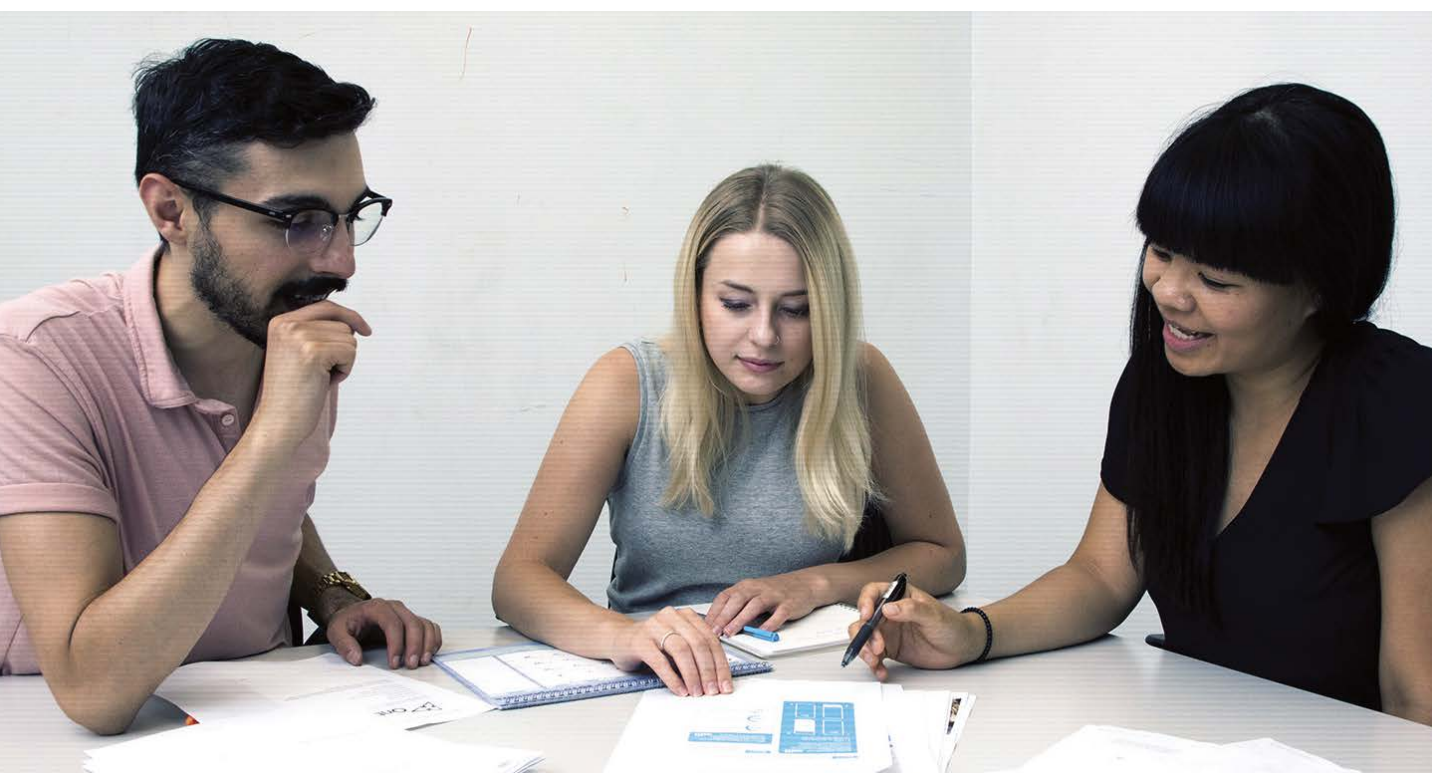
> *Even after only reporting for two months I can already see the benefit of this data collecting program […] I am looking forward to continuing the use of this toolkit after the results have been compiled and analyzed. Our participation of the pilot project helped find a new way to gather information about the customers' technology usage.*
>
> Wikwemikong First Nation Public Library

figure 2   OLA Super Conference Audience Poll, current level of evidence-based decision-making at libraries

To what degree (if any) are your library's decisions related to technology services based on evidence (i.e., analysis of internal data and/or community feedback)? **10**

0 = none
4 = all of our decisions are currently evidence-based

1   0%   80% **2**

3   20%   0% **4**
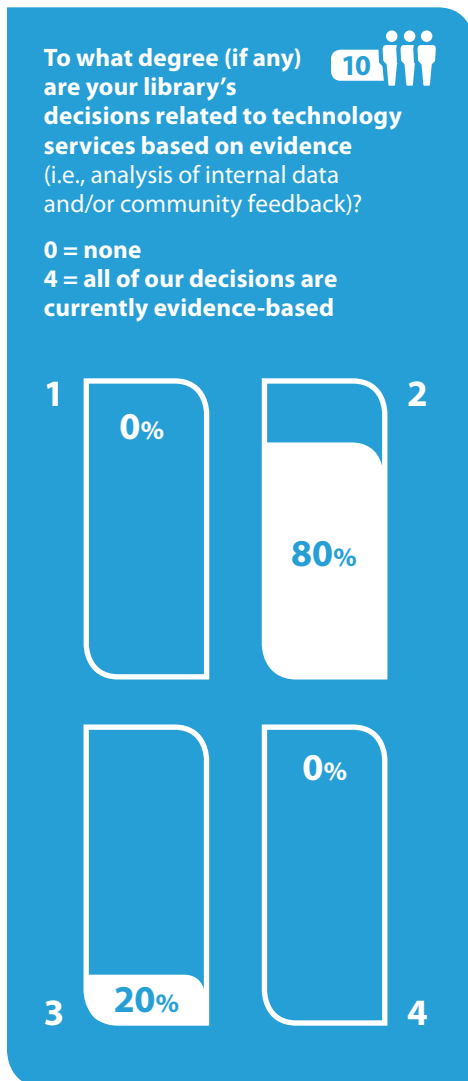
figure 3   OLA Super Conference Audience Poll, biggest challenges faced by libraries related to measuring the outcomes of technology services

What is the biggest challenge you face in terms of measuring the outcomes of technology services at your library? 19

37%   **Conceptualization of the outcomes - knowing what to measure**

53%   **Implementation of data gathering and analysis - finding the resources**

11%   **Comparability of results - benchmarking against your peers or past performance**
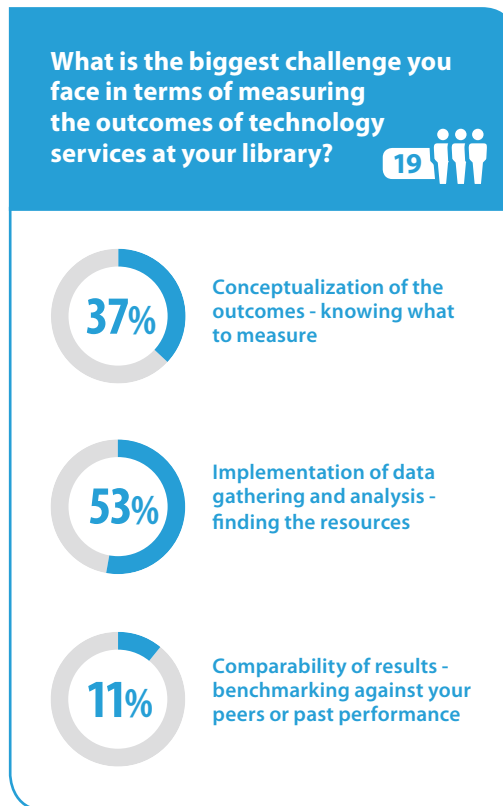
(C) **Increased recognition among staff of the value of the technology services delivered**

The pilot implementation of *Bridge* involved library staff in several ways. First, the library staff leading the pilot project at each library system was involved in the development of *Bridge* through initial consultations and provided ongoing feedback to the project team. Front-line staff completed the Staff Survey, which asked about their delivery of technology services and ability to respond to customer inquiries. Finally, project staff worked with the library staff to administer the Customer Survey – often, library staff or volunteers would walk customers through the survey, and their feedback on the survey design was essential to its ongoing improvement.

Some libraries reported an increased level of awareness and appreciation among staff of the outcomes and impacts of the services they delivered, as well as recognition of the importance of staff support to customers' ability to make the best of the technology services available to them.

> *Staff are now better aware of technology and services offered to the public and feel more comfortable speaking about them and working with the public.*
>
> Innisfil ideaLAB & Library

(D) **Better understanding of frontline service delivery**

The Staff Survey component of *Bridge* provided library staff with an opportunity to gather feedback, in many cases for the first time, on the needs of frontline staff (and for some libraries, also volunteers) who support the delivery of technology services to customers. This feedback loop enabled immediate action to be taken by library systems to plan for additional training and support for staff and volunteers. In turn, these actions allowed the library systems to better deliver technology services. Some libraries, such as Toronto Public Library were able to use the results of the pilot Staff Survey to inform staff development plans.

> *The Toolkit […] provided insight on staff delivery of technology services at the library. TPL was able to learn which types of questions staff were asked most often, their comfort level answering customer questions, their comfort level in delivering technology classes and support and the types of additional support that they would require in order to achieve higher comfort levels delivering technology services. The results were discussed with the Staff Development Department and it provided them insight to the type of support the staff require to improve their technology service delivery.*
>
> Toronto Public Library

E **Increased awareness among customers of technology services**

During the interim presentation of the project at the 2017 OLA Super Conference, a quick audience poll confirmed a key finding of initial consultations – that quantitative evidence of technology service outcomes is more beneficial to libraries when complemented with individual impact stories (see Figure 4).

While the Customer Survey captured these individual snapshots of impact, the administration of the survey itself also created a more informal opportunity for staff members to engage with customers and ask about their use of technology services.

Initial consultations with library staff had also revealed that in many cases, customers are not aware of the range of technology services offered by the library.

As such, several libraries shared that the very act of completing the Customer Survey had resulted in increased awareness of technology services.

figure 4   OLA Super Conference Audience Poll, reactions to Toolkit features presented

Which feature(s) of the Toolkit are you most excited about to enhance your technology services?   24

21% Easily obtain feedback from patrons

8% Ensure staff feel equipped to deliver service

17% Track monthly availability, usage and outcome data

38% Capture individual impact stories

17% Compare against historical and peer performance

8% Access (and contribute to) shared knowledge

38% All of the above

III. Findings from the Pilot

This section presents an overview of the Customer Survey conducted during the second pilot (July 19 to October 31, 2017) and its results.[3]

1. About the Promotion and Deployment of the Customer Survey

Each participating library system deployed the Customer Survey in different ways. Some library systems conducted the survey across multiple branches, while others contained the pilot to one branch. Smaller library systems were able to rollout the pilot system-wide.[4]

In terms of promotion, libraries used a variety of tactics, including:

- Custom bookmarks displaying a simplified URL
- Installing the survey page as a home page on public workstations
- Promotion of the survey by staff at technology-related classes
- On-the-spot surveys conducted by roving staff members equipped with iPads
- Website and social media posts
- Use of printed surveys on-site at the library

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3. Wikwemikong First Nation Public Library was delayed in launching *Bridge* due to a flood in the library but began promoting the survey at its one branch directly to users of technology services in October. Naotkamegwanning First Nation Public Library was unable to conduct the survey due to unexpected library renovations and resource issues during the time of the pilot.

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4. Innisfil ideaLAB & Library conducted the pilot at its four branches; Kitchener Public Library conducted the pilot at its central branch; Mattawa Public Library conducted the pilot at its single branch; Perth & District Union Library conducted the pilot at its single branch; Toronto Public Library conducted the pilot at five of its 100 branches; and Windsor Public Library conducted the pilot at its central branch and a small community branch.

2. Responses from Participating Libraries

In total, the participating libraries gathered 1,561 survey responses. The breakdown of these responses is presented in Figure 5.

As shown in Figure 5, more than three-quarters (77%) of the total responses came from customers at Toronto Public Library. In other words, the results are primarily representative of outcomes achieved in Toronto, although it should be noted that Toronto's population makes up approximately 84% of the total combined population of the participating libraries. Therefore, Toronto's contribution to the overall results is commensurate with its population.

figure 5   **Breakdown of customer survey responses, by participating libraries**

Library	Responses
Innisfil ideaLAB & Library	37
Kitchener Public Library	204
Mattawa Public Library	33
Perth & District Union Public Library	41
Toronto Public Library	1207
Wikwemikong First Nation Public Library	12
Windsor Public Library	27
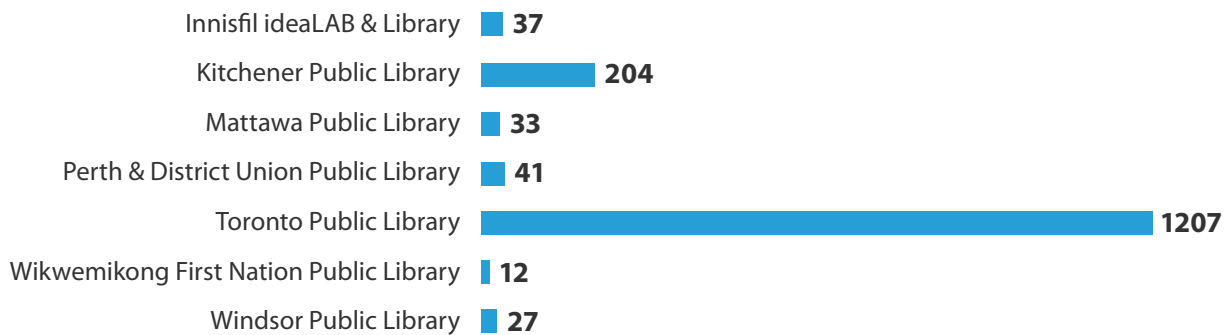
Technology Services Used by Respondents

The survey first asked which technology services the customer had used within the month. Based on the services they reported having used, customers were then asked questions about the related impacts and outcomes that resulted from using technology. The clear majority (84%) of customers who responded to the survey had used WiFi Internet access at the library and one-third (33%) had used an Internet-enabled workstation (see Figure 6). Use of Microsoft Office software, WiFi outside of library hours, and laptops/tablets in the library ranged from 8%–12% among respondents, while all other services were used by 5% or less of customers.

figure 6   **Technology services used by customer survey respondents**

Survey question: Which of the following services have you used in (the month in which the survey was completed)? (multiple answers permitted)

Connectivity

WiFi Internet access at the library	84%
Access to Internet at a library workstation	33%
WiFi Internet access outside the library (after hours)	10%
Access to Internet through a borrowed WiFi Hotspot	4%

Equipment and Software

Microsoft Office software	12%
Laptops and/or tablets borrowed for general use (at the library)	8%
Devices used for entertainment	5%
Fabricating and manufacturing equipment	5%
Content creation and editing software	4%
Electronics, circuitry and robotics	3%
Assistive technology equipment	3%
Audio-visual production equipment	2%
Business-related software	2%

One-to-One Support

Basic computer skills	4%
Accessing the library's electronic resources	3%
Using Microsoft Office software	2%
Digital design	2%
Using web resources	2%
Email	2%
Subject research	1%
Social media	1%
Internet safety	1%
Mobile devices	1%
Job search	1%
Programming and coding	1%
Business research and skills	1%

Technology Class

Basic computer skills	2%
Digital design	2%
Internet safety	2%
Using web resources	2%
Using Microsoft Office software	1%
Accessing the library's electronic resources	1%
Programming and coding	1%
Social media	1%
Mobile devices	1%
Email	1%
Business research and skills	1%
Subject research	1%
Job search	1%

Demographic Groups

The Customer Survey also asked both mandatory and voluntary demographic questions. Throughout this report, general survey results are presented alongside results filtered by specific demographic groups. Age-related filters are based on required responses at the beginning of the survey, and other demographic groups are based on optional questions at the end of the survey. The response base for these groups is as follows:

- 34 years of age or younger: 722 responses/46% of the sample
- Over 55 years of age: 309 responses/20% of the sample
- Visible minorities: 346 responses/22% of the sample
- Immigrants: 397 responses/25% of the sample
- Low income: 469 responses/30% of the sample

Margin of Error for the Customer Survey

The margin of error for the analysis of the Customer Survey contained in this report is estimated at 3–5%, depending on the question, and assuming a randomized sample – at a 95% confidence interval. Therefore, only differences that are greater than 5% should be taken into consideration and only findings above this threshold are highlighted in the analysis.

A Note on Data Collected through Other *Bridge* Toolkit Elements

Bridge also gathered data on the availability and usage of technology services at participating libraries, as well as gathering feedback from staff on the delivery of technology services. The results of these two elements are not included in this analysis for the following reasons:

- **Availability and usage indicators** were designed to track the volume of technology services offered by library systems over time, and as compared to peer-based benchmarks. The level of completion among participating libraries in this aspect of *Bridge* did not allow for reporting of aggregate results. The difficulty faced by library staff in gathering this data, and the variance in the indicators that libraries were able to gather, supports a conclusion (further discussed in Section IV) that this element of *Bridge* needs refinement based on further consultations with both libraries and other stakeholders (such as the Ontario Ministry of Tourism, Culture and Sport, which tracks similar data as a subset of its annual Ontario library statistics).

- **A Staff Survey** was also designed to gather feedback from frontline service delivery personnel. The staff survey gauged how prepared frontline staff are to deliver technology services and captured areas where additional support can better equip staff in service delivery. As discussed in Section II, libraries were able to use the results to inform decisions at a library system-level around training and resources. However, the results of the staff survey are inherently not suitable for aggregate reporting, as the staff survey shows changes over time. The short duration of the pilot combined with low completion rates prevent aggregate time-series analysis at this point. As discussed further in Section IV, less frequent administration of the staff survey (quarterly, rather than monthly) is likely to improve response rates.

The availability and usage indicators and the Staff Survey are important components of *Bridge* that would provide an opportunity for public libraries across Ontario to track and benchmark the volume of and demand for their technology services, as well as ensure that staff are well-equipped to support customers in taking advantage of the services offered. However, in order to benefit from these components, partner libraries will need more consistent and complete data that is regularly collected.

3. Outcome Framework

- The survey results in this section are presented in accordance with the Outcome Framework presented in Figure 7. As described in the Project Summary, the framework is two-tiered. The first two areas – **digital inclusion**[5] through access to technology and **digital literacy**[6] skills training – are the primary outcomes of the technology services offered by public libraries. Once these basic requirements for participation in today's digital world are met, technology services at public libraries unlock opportunities in many other areas, leading to the following secondary outcomes:

- **Community, social**[7] and **civic engagement**[8]**:** Increased community cohesion, and social and civic participation

- **Creativity and innovation:** Engagement in the creative process enabling self-expression, and creative and innovative content

- **Entrepreneurship and business development:** Support to start, manage, and grow small businesses which support employment

- **Workforce development:** Preparation of job-seekers for the workforce through educational activities, employment, professional development and lifelong learning opportunities

Indicators were developed for each outcome area to determine how libraries could measure the extent to which the outcome was achieved. The indicators are further described in the next section, alongside the aggregated survey results.

figure 7   Outcome Framework for technology services provided by public libraries

Primary Outcomes

Digital Inclusion + Digital Literacy

Secondary Outcomes

Community, social & civic engagement | **Creativity & innovation** | **Entrepreneurship & business development** | **Workforce development**
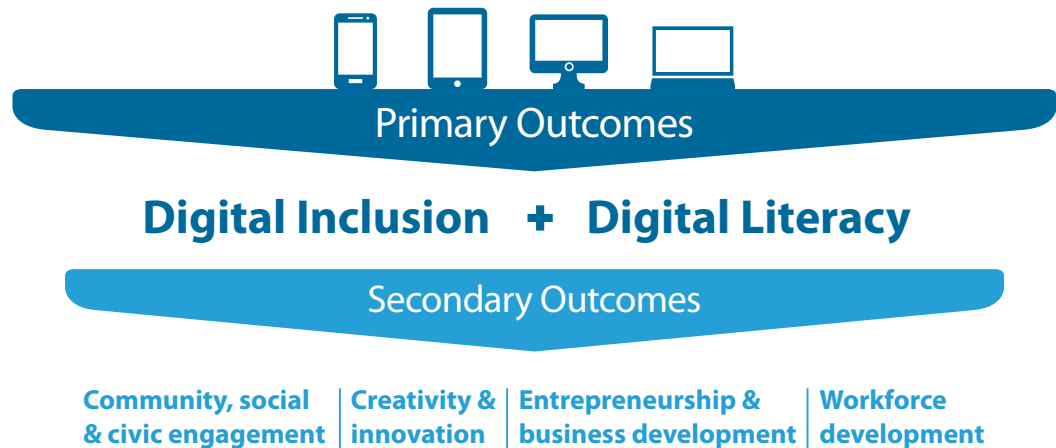
> *Participation in this project has allowed the library to think about technology and technology services in a broader way and move past outputs (how many people are using the computers) to outcomes (how are they benefiting from that service).*
>
> Perth & District Union Public Library

5, 6, 7, 8. For definitions see Section V. *Key Terms and Definitions*.

4. Findings from the Pilot Project

Primary Outcomes | Digital Inclusion

Increasing digital inclusion among Ontarians was identified as one of the primary outcome areas related to the provision of technology services at Ontario public libraries. Access to core services, such as an Internet connection and basic technology equipment, is an essential requirement for economic, social and/or civic participation, and public libraries contribute to bridging the digital divide through the provision of technology services.

The key performance indicators related to digital inclusion are:

(A) **Access to technology** by customers without alternative means of access, and reasons for using technology at the library for customers with alternative means of access

(B) **Use of technology service(s) with or on behalf of someone else** (e.g., parents, children, elderly person, etc.)

In the pilot, the technology services linked to the digital inclusion outcome area were:

- WiFi Internet access at the library
- WiFi Internet access outside of the library (after hours)
- Access to Internet at a library workstation
- Access to Internet through a borrowed WiFi Hotspot
- Laptops and/or tablets borrowed for general use (at the library or for use outside the library)
- Devices used for entertainment (not applicable to the use of technology with or on behalf of others)
- Assistive technology equipment
- Electronics, circuitry and robotics equipment
- Fabricating and manufacturing equipment
- Audio-visual production equipment
- Microsoft Office software
- Business-related software
- Content creation and editing software

(A)   **Access to technology**

The survey results showed that 56% of customers who used technology services at a public library would not otherwise have had access to those services, as illustrated in Figure 8. As shown below, 68% of respondents aged 55 and older said that the public library was their only point of access to the technology service(s) that they used. Conversely, respondents that were 34 and younger were more likely to have alternate means of accessing these technologies without the availability of library services. Customers that identified as low income were more likely to find that library services gave them access to technology that they would otherwise not have had access to, with 63% reporting that this was the case.

68% of respondents aged 55 and older said that **the public library was their only point of access** to the technology service(s) that they used.

Internet access was the service that was most used at the library without an alternate point of access at 46%. Of those customers, 70% accessed the Internet through WiFi and 30% accessed the Internet through Internet-enabled workstations.

As shown in Figure 9, younger customers (34 and younger) and customers that identified as a visible minority were more likely than the overall response base, and far more likely than older customers, to be using the library's WiFi service without an alternate means of access. In fact, 78% of respondents in both the younger and visible minority groups who were using a technology service at the library without other access, said that it was the WiFi service they were using. Conversely, older customers (55 and older) were more likely to be using a library workstation to access the Internet at the library without access to that technology elsewhere (49%).

The preliminary results suggest that a majority of users who use library technology services would not otherwise have had access to at least some of that technology. More strikingly, nearly half of customers that use technology services use it to access the Internet when they would not otherwise have been able to do so. Therefore, it appears that public libraries in Ontario make a significant contribution to bridging inequities of access to technology services.

Customers that identified as a visible minority were more likely than the overall response base... to be using the library's WiFi service without an alternate means of access.

> *The toolkit is helping us make informed choices about what we have already purchased and will influence future purchases as well. For example, from our outcomes report on Digital Inclusion, we see that WiFi is a higher used service than Internet access on a workstation […], an indicator that more people are bringing in their own devices. Staff training must go far beyond training them on how to give assistance on only our workstations, but also must include familiarity with different devices."*

Windsor Public Library

In Figure 8 and all following charts, the first bar shows the overall average, followed by results for demographic groups that differed significantly from the overall average. The number of responses is shown in brackets for each group (e.g., overall, 55 and older, etc.).

figure 8 **Access to technology**

Survey question: Did the service(s) you used give you access to technology you would not have otherwise had access to?

Overall respondents (1228)	**56%**	**44%**
55 and older (233)	**68%**	**32%**
34 and younger (565)	**50%**	**50%**
Low income (467)	**63%**	**37%**

◼ yes ▨ no
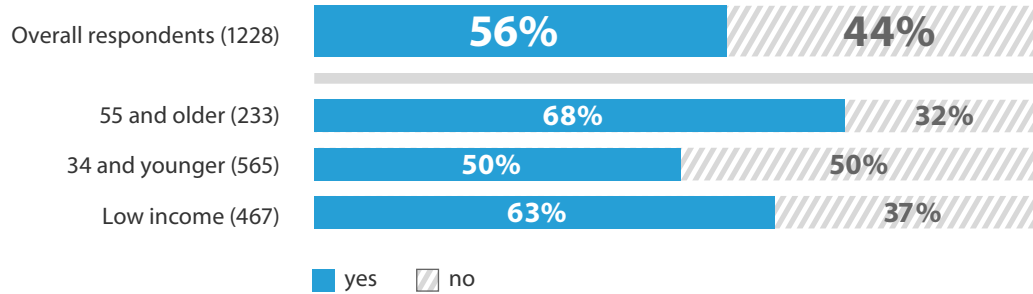
figure 9 **Technology services contributing to increased access to technology**

Survey question: If so, which service(s)? (follow up to "yes" responses from Figure 8)

WiFi Internet access at the library
- 70%
- 54%
- 78%
- 78%

Access to Internet at a library workstation
- 31%
- 49%
- 19%
- 23%

◼ Overall respondents (652) ◼ 55 and older (147)
◼ 34 and younger (277) ◼ Visible minority (193)
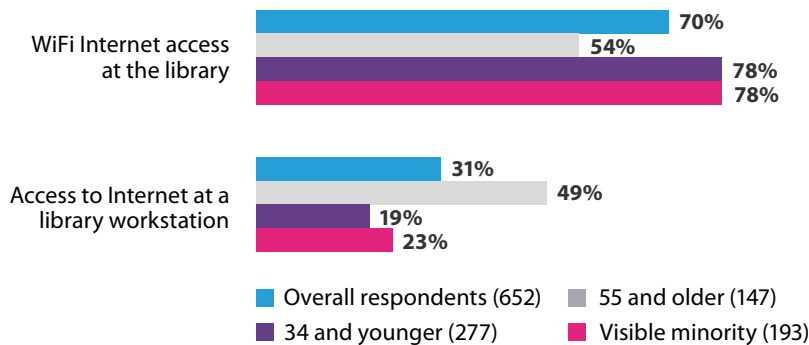
As shown in Figure 8, 44% of library customers who use technology services at a public library have the option to access similar services elsewhere (e.g., at home, work or school). When asked about the reasons why they decided to use these services at the library, 59% said that it was for a change of scenery, and 46% said that it was because of the convenience of the library's location (see Figure 10).

Younger customers (34 and younger) were more likely to be using the services at the library for a change of scenery. Older customers (55 and older), on the other hand, were more likely to be using the services as a supplement to other library services and resources.

> Younger customers (34 and younger) were more likely to be using the services at the library for a change of scenery.

figure 10 **Reasons for use of technology services at the library in case of availability of alternate access**

Survey question: If not, what are the most important reasons why you decided to use the service(s) at the library? (follow-up to "no" responses presented in Figure 8)

Change of scenery
- 59%
- 29%
- 70%

Convenience of location (e.g., during lunch break, or while running errands)
- 46%
- 32%
- 45%

As a supplement to other library service/resource (e.g., to look up book reviews, reading lists, and other aids for selecting materials)
- 26%
- 38%
- 23%

Quality of service/program
- 16%
- 24%
- 15%

Gaps in access (e.g., moving, power outage)
- 9%
- 7%
- 10%

Competition for access (e.g., siblings/parents using the device/connection at home, not enough devices at school)
- 7%
- 7%
- 8%

Other
- 17%
- 22%
- 15%

■ Overall respondents (529)   ■ 55 and older (72)
■ 34 and younger (274)

B   **Use of technology service(s) by customers on behalf of someone else**

Survey results showed that 8% of customers used technology services with or on behalf of someone else. Of customers who used technology services with or on behalf of someone else, nearly one in three said that they used it with or on behalf of a parent, and younger customers were more likely to report doing so. Almost one in four of respondents said that they used the service with or on behalf of children, with customers identifying as visible minorities or immigrants more likely to do so. An additional 11% of respondents said that they supported an elderly person in using the service.

> *Free WiFi Internet access has definitely made a difference in my life in so many ways. I hope you keep up the good job in providing this [service] to the public.*
>
> Customer comment via survey

Primary Outcomes | Digital Literacy

Increasing digital literacy among Ontarians was identified as the second primary outcome area related to the provision of technology services. Digital literacy is a requirement for meaningful participation and connection in the digital world. In addition to providing access to the technology itself, libraries across Ontario offer a wide range of structured and semi-structured training as well as individual support to customers at all levels of digital competence.

The key performance indicators related to digital literacy are:

A Increased **digital comfort** gained as a result of using technology service(s) at the library

B **Introduction to new technologies,** and the **adoption and continued use** of those technologies

In the pilot, the technology services linked to the digital literacy outcome area were:

- Access to Internet through a borrowed WiFi Hotspot
- Content creation and editing software (applicable to new technology adoption only)
- Electronics, circuitry and robotics equipment (applicable to new technology adoption only)
- Fabricating and manufacturing equipment (applicable to new technology adoption only)
- Audio-visual production equipment (applicable to new technology adoption only)
- Classes and individual support related to basic computer skills, email, Internet safety, using Microsoft Office software (increased digital comfort only), and using mobile devices
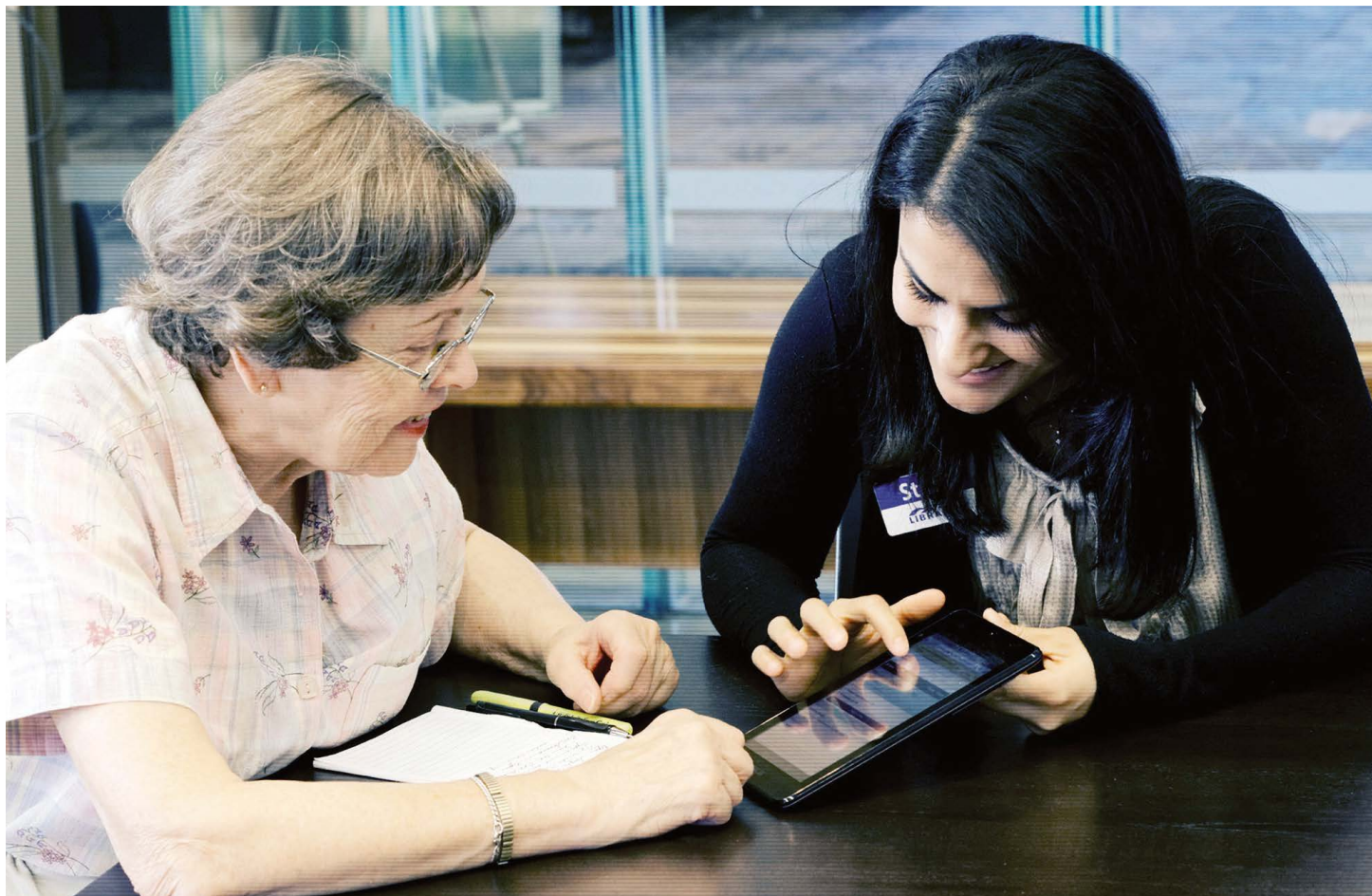
The survey asked customers who had used one or more of the services related to digital comfort to state whether or not they felt more comfortable using digital technology (on a scale of 0: not at all, to 4: a lot) after using library technology services. As shown in Figure 11, overall, 84% of respondents indicated at least some increase in their level of digital comfort.

figure 11 Digital comfort (average score: 2.51)

Survey question: How much more comfortable are you in using digital technologies than you were before using the library's technology service(s)?

	4: A lot	3	2	1	0: Not at all
Overall respondents (530)	33%	25%	20%	6%	16%
55 and older (143)	34%	22%	22%	13%	10%
34 and younger (191)	34%	25%	21%	3%	17%
Visible minority (133)	44%	26%	15%	6%	9%
Immigrants (170)	38%	26%	15%	6%	15%
Low Income (227)	35%	27%	19%	5%	15%
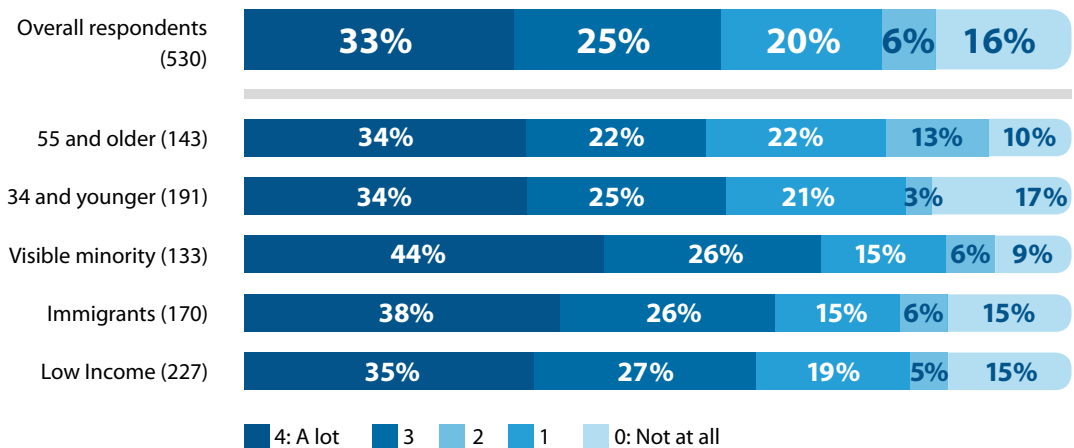
84% of respondents indicated at least some **increase in** their level of **digital comfort.**

Customers identifying as a visible minority reported higher rates of increased digital comfort, with 91% reporting at least some increase.

Customers identifying as a visible minority reported higher rates of increased digital comfort, with 91% reporting at least some increase, and 44% saying that they were a lot more comfortable using technology than before.

B **Introduction to new technologies and their adoption and continued use**

The pilot survey showed that technology services offered by public libraries introduced customers to new technologies and led to the adoption of those technologies on a longer-term basis. Overall, 44% of customers reported that the service(s) they used at the library introduced them to new technologies. Older customers were more likely to have been introduced to new technology at the library, with over half (52%) reporting that this was the case (see Figure 12).

figure 12 | **New technology adoption**

Survey question: Did any of the services you used introduce you to new technologies?

Overall respondents (534): **44%** yes | **56%** no

55 and older (142): **52%** yes | **48%** no

■ yes ▨ no
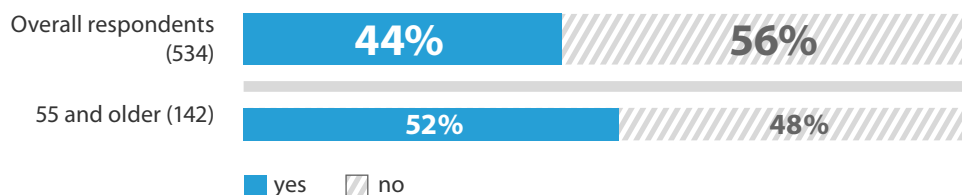
figure 13 | **Continued use of technology**

Survey question: If so, do you continue to use that technology? (follow-up question to "yes" responses presented in Figure 12)

92% | **8%**

Overall respondents (230) ■ yes ▨ no
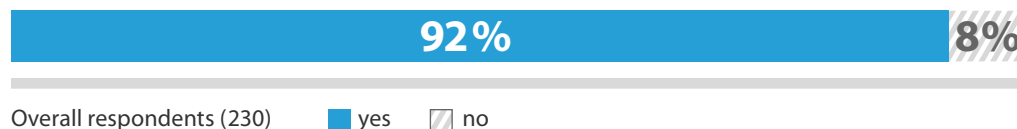
Ontario public libraries play a key role in introducing customers to new technologies. At the same time, the high rate of longer-term technology adoption indicates that these new technologies continue to be relevant to customers after their initial introduction. The library environment, and the support provided by library staff, are contributing to making customers comfortable with the continued use of new technology, as well as contributing to an increase in an overall sense of digital comfort.

Secondary Outcomes | Community, Social and Civic Engagement

As noted on page 30, the primary outcome areas of digital inclusion and digital literacy empower individuals and enable them to meaningfully participate in the digital world, including engagement with their community, friends, family, as well as participating more in society as an active citizen.

The key performance indicators related to community, social and civic engagement are:

(A) Increased **community engagement**

(B) Increased **social engagement**

(C) Access to **government resources online**

In the pilot, the technology services linked to the community, social and civic engagement outcome area were:

- WiFi Internet access at the library
- WiFi Internet access outside the library (after hours)
- Access to Internet at a library workstation
- Access to Internet through a borrowed WiFi Hotspot
- Laptops and/or tablets borrowed for general use (at the library or outside the library)
- Assistive technology equipment
- Classes and individual support related to accessing the library's electronic resources, using web resources, using mobile devices, social media and email (not applicable to government resources online)
- Electronics, circuitry and robotics equipment (not applicable to government resources online)
- Devices used for entertainment (only applicable to social engagement)

(A) Community engagement

The survey asked customers who had used one or more of the services related to the community engagement KPI to state whether using the technology service(s) at the library helped them engage with their community (on a scale of 0: not at all, to 4: a lot). As shown in Figure 14, overall, 81% of these customers indicated at least some increase in their level of community engagement, with nearly one in four saying that it did so "a lot."

Customers who indicated a significant increase in community engagement were also asked to identify which activities contributed most to that outcome. As shown in Figure 15, learning about current events and news was the highest contributor to increased community engagement, with 68% of respondents saying that it was so.

Interestingly, older customers were less likely to use technology services at the library to engage with community groups, learn about volunteer opportunities, or learn about politics. However, customers identifying as visible minorities were more likely to see the library's technology services increasing their engagement with community groups.

figure 14

Community engagement (average score: 2.19)

Survey question: How has using the technology service(s) helped you engage with your community?

	4: A lot	3	2	1	0: Not at all
Overall respondents (1176)	23%	22%	25%	11%	19%
Low income (463)	27%	22%	25%	9%	17%
Immigrants (396)	21%	24%	26%	10%	19%
Visible minority (343)	22%	28%	26%	8%	16%
34 and younger (532)	21%	23%	26%	12%	18%
55 and older (230)	25%	20%	22%	12%	21%

Legend: ■ 4: A lot ■ 3 ■ 2 ■ 1 ■ 0: Not at all
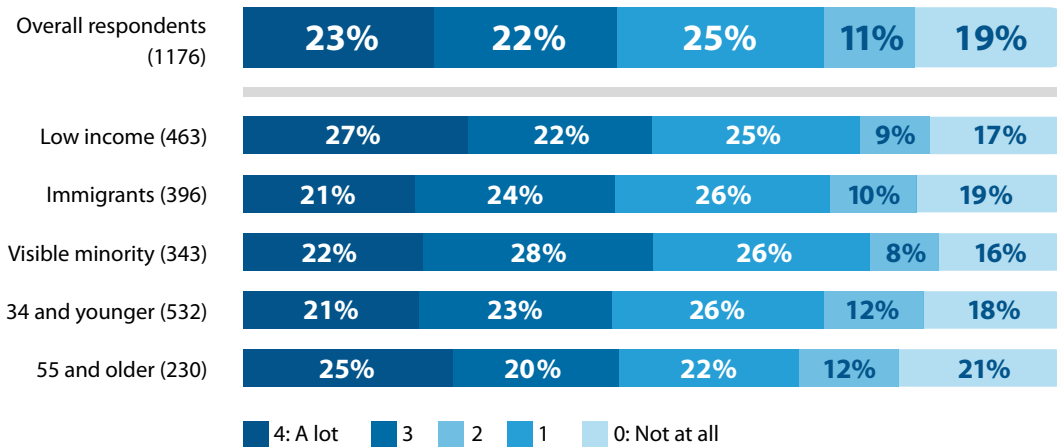
figure 15

Activities contributing to increased community engagement

Survey question: What activities contributed most to your increased engagement with your community? (follow-up to "3" or "4" responses presented in Figure 14)

Activity	Overall respondents (514)	55 and older (97)	Visible minority (159)
Learning about current news/events	68%	72%	73%
Learning about, participating in, organizing or managing a civic or community group or non-profit	37%	25%	46%
Learning about volunteering opportunities in the community	35%	27%	39%
Learning about politics (e.g., local candidates, voting process)	31%	23%	33%
Other	20%	25%	16%

Legend: ■ Overall respondents (514) ■ 55 and older (97) ■ Visible minority (159)

(B) **Social engagement**

The survey also asked customers who had used one or more of the services related to the social engagement KPI to state whether using the technology service(s) at the library helped them connect with others and be more social (on a scale of 0: not at all, to 4: a lot). As shown in Figure 16, 81% of responding customers indicated at least some increase in their level of social engagement, with nearly one in four saying that it did so "a lot."

figure 16 | **Social engagement**

Survey question: How has using the technology service(s) helped you connect with others and be more social?

	4: A lot	3	2	1	0: Not at all
Overall respondents (1165)	24%	24%	21%	12%	19%
Low income (464)	27%	25%	21%	9%	17%
Immigrants (396)	25%	24%	22%	12%	17%
Visible minority (344)	27%	30%	21%	10%	13%
34 and younger (528)	23%	24%	22%	14%	18%
55 and older (225)	22%	24%	21%	12%	21%

■ 4: A lot ■ 3 ■ 2 ■ 1 ■ 0: Not at all
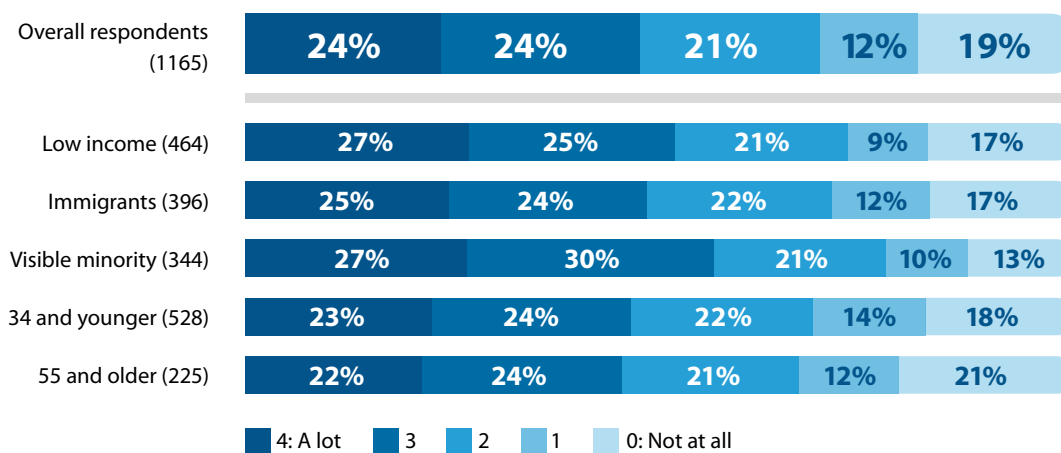
Customers who responded to the question about increased social engagement with a 3 or 4 – in other words, cases where technology services had notably helped customers engage with their friends and family – were asked to identify which activities contributed most to the outcome. As shown in Figure 17, communicating with friends and family was the highest contributor to increased community engagement, with 65% of respondents saying that it was so.

As shown in Figure 17 there are slight differences in how different demographic groups of customers use technology services at libraries for social purposes. For example, a higher proportion of immigrant customers reported "learning new skills" as a key contributor to their technology-enabled social engagement. Customers who identified as low income, on the other hand, were more likely to use technology services to find support for a personal issue.

> ”
> *The pilot had a great impact on our library and our staff. It really showed us how so many people, in and around the community, depend on us for their everyday needs, for example, as their way of staying connected to family and friends, online banking, online courses, government sites, or simply looking to rent or buy a house. We have become and are the helping hands to their everyday needs.*
>
> Mattawa Public Library

figure 17

Activities contributing to increased social engagement

Survey question: What activities contributed most to your increased social engagement? (follow-up question to "3" or "4" responses presented in Figure 16)

Communicate with friends and family
- Overall respondents: 65%
- Immigrants: 65%
- Low income: 67%

Learn new skills
- Overall respondents: 37%
- Immigrants: 43%
- Low income: 39%

Get help with a project
- Overall respondents: 29%
- Immigrants: 33%
- Low income: 27%

Find reviews of movies, books or music
- Overall respondents: 26%
- Immigrants: 27%
- Low income: 26%

Pursue a hobby or interest
- Overall respondents: 25%
- Immigrants: 26%
- Low income: 29%

Find support for a personal issue
- Overall respondents: 24%
- Immigrants: 25%
- Low income: 31%

Find recipes
- Overall respondents: 15%
- Immigrants: 12%
- Low income: 11%

Organize an event
- Overall respondents: 11%
- Immigrants: 10%
- Low income: 7%

Follow sports or celebrity news
- Overall respondents: 9%
- Immigrants: 11%
- Low income: 10%

Meet new friends
- Overall respondents: 8%
- Immigrants: 10%
- Low income: 12%

Play games
- Overall respondents: 7%
- Immigrants: 5%
- Low income: 7%

Explore family genealogy
- Overall respondents: 6%
- Immigrants: 4%
- Low income: 4%

Other
- Overall respondents: 6%
- Immigrants: 4%
- Low income: 5%

Legend:
- Overall respondents (527)
- Immigrants (187)
- Low income (230)

(C)   Access government resources online

The final KPI in this outcome area is the use of technology services to access government services and/or resources through online channels. As shown in Figure 18, 34% of respondents said that they had accessed government resources using the library's technology service(s).

figure 18 Access government resources online

Survey question: Did you use the technology service(s) to access government services or resources online?
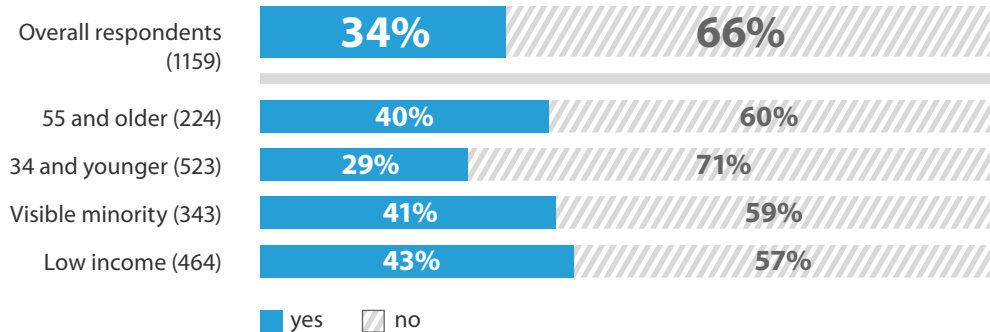
	yes	no
Overall respondents (1159)	34%	66%
55 and older (224)	40%	60%
34 and younger (523)	29%	71%
Visible minority (343)	41%	59%
Low income (464)	43%	57%

34% of respondents said that they had **accessed government resources** using the library's technology service(s).

The use of technology services to access government services or resources was relatively higher among customers identifying as low income (43%) or a visible minority (41%), as well as older customers (40%). As shown in Figure 19, when asked what government services/ resources they had used the library's technology service(s) to access, the top answers were that they "got government forms" (40%) and "learned about government programs or services" (38%).

Older customers who used the technology services to access government resources were more likely to have gotten government forms, but less likely to have submitted the forms online.

> *Increased civic engagement was a pleasant surprise. […] Previously, the importance of access to e-government in the library was only available in anecdotal form, and we now have numbers and percentages that support the need for that critical access.*
>
> Kitchener Public Library

figure 19

Government services and resources accessed using technology services

Survey question: If so, what government services/resources did you access?
(follow-up question to "yes" responses presented in Figure 18)

Got government forms
40%
47%

Learned about government programs or services
38%
40%

Submitted forms online
34%
21%

Learned about municipal, provincial or federal laws or regulations
31%
33%

Got help from a government official or agency
30%
31%

Applied to government programs or services
22%
17%

Found advice or assistance with a legal question or problem
19%
21%

Learned about permits or licenses
19%
16%

Other
11%
19%

Applied for a permit or license
10%
6%

Accessed the justice system
6%
3%

■ Overall respondents (385)   ■ 55 and older (86)

Secondary Outcomes | Creativity and Innovation

Another secondary outcome area enabled by increased digital inclusion and digital literacy is creativity and innovation, where technology services provide an opportunity for library customers to engage in the creative process.

The key performance indicator related to creativity and innovation is:

(A) **Making a creative product**

In the pilot, the technology services linked to the creativity and innovation outcome area were:

- Electronics, circuitry and robotics equipment
- Fabricating and manufacturing equipment
- Audio-visual production equipment
- Content creation and editing software
- Classes and individual support related to programming and coding, and digital design

As shown in Figure 20, 41% of respondents indicated that they made a creative product using the library's technology service(s). Younger customers were somewhat more likely to have used the services to make a creative product (47%).

---

figure 20 **Making a creative product**

Survey question: Did you use the technology service(s) to make a creative product?

Overall respondents (502) **41%** **59%**

34 and younger (180) **47%** **53%**

■ yes ▨ no
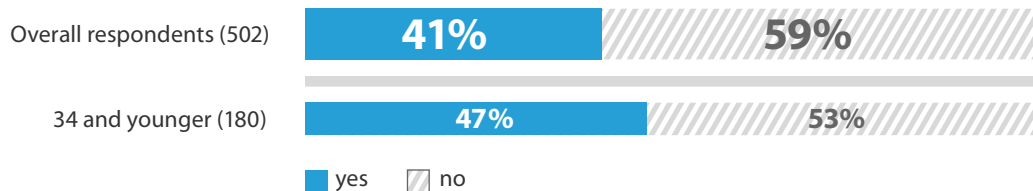
As shown in Figure 21, of respondents who said they used the technology services to make a product, more than half (51%) said that they used the fabricating and manufacturing equipment to do so, while 40% said that they used content creation and editing software. Older customers were more likely to have used the fabricating and manufacturing equipment, as well as audio-visual production equipment.

Younger customers were somewhat more likely to have used the services to make a creative product (47%).

---

figure 21

Technology services used for creative production

Survey question: If so, which service(s)? (follow-up question to "yes" responses presented in Figure 20)

Service	Overall	55 and older
Fabricating and manufacturing equipment	51%	63%
Content creation and editing software	40%	32%
Electronics, circuitry and robotics	15%	11%
One-to-one support - Digital design	14%	21%
Audio-visual production equipment	13%	26%
Technology class - Digital design	10%	11%
Technology class - Programming and coding	6%	11%
One-to-one support - Programming and coding	3%	5%

■ Overall respondents (93)   ■ 55 and older (19)

> *Had my book printed by the Tech department – allowed me to sell this previously published work in print form. It had only been available in e-book form previously.*
>
> Customer comment via survey

Among the most common creative products made using a library service were multimedia and writing projects with those identifying as low income and immigrant customers were more likely to have completed a writing project (see Figure 22). Among the 38% of respondents that reported "Other" to this question, the most common product was a 3D printed project.[9] This finding is consistent with the observation from Figure 21 that "fabricating and manufacturing equipment" was the most commonly used technology service for creative production – and so the option has since been added to the questionnaire.

---

figure 22   **Creative products made using technology services**

Survey question: What did you make? (follow-up question to "yes" responses presented in Figure 21)

Multimedia project
- Overall respondents: 28%
- 55 and older: 16%
- 34 and younger: 26%
- Immigrants: 26%
- Low income: 30%

Writing
- Overall respondents: 22%
- 55 and older: 16%
- 34 and younger: 32%
- Immigrants: 41%
- Low income: 34%

Film/video
- Overall respondents: 13%
- 55 and older: 11%
- 34 and younger: 18%
- Immigrants: 19%
- Low income: 9%

Audio or music recording
- Overall respondents: 9%
- 55 and older: 0%
- 34 and younger: 13%
- Immigrants: 7%
- Low income: 7%

Other
- Overall respondents: 38%
- 55 and older: 32%
- 34 and younger: 39%
- Immigrants: 30%
- Low income: 36%

Legend:
- Overall respondents (90)
- 55 and older (19)
- 34 and younger (38)
- Immigrants (27)
- Low income (44)

---

9. Of the 38% of respondents that reported "Other" to this question, almost all indicated that 3D printing was the type of product created. This option has since been added to the questionnaire.

Secondary Outcomes | Entrepreneurship and Business Development

Entrepreneurship and business development is another secondary outcome area enabled by increased digital inclusion and digital literacy. From providing an avenue for research and information about opening or growing a business, to the means of connecting with potential customers, investors and partners, technology services at public libraries play a key role in helping entrepreneurs and business owners start, grow and/or manage their operations.

The key performance indicators related to entrepreneurship and business development are:

(A) **Business outcomes** resulting from activities undertaken using technology service(s) at the library (e.g., starting a business, connecting with potential customers, etc.)

(B) **Employment supported** by businesses using technology service(s) at the library for business-related purposes

In the pilot, the technology services linked to the entrepreneurship and business-development outcome area were:

- WiFi Internet access at the library
- WiFi Internet access outside of the library (after hours)
- Access to Internet at a library workstation
- Access to Internet through a borrowed WiFi Hotspot
- Laptops and/or tablets borrowed for general use (use at the library or borrowed for use outside the library)
- Assistive technology equipment
- Fabricating and manufacturing equipment
- Audio-visual production equipment
- Business-related software
- Content creation and editing software
- Classes or individual support related to accessing the library's electronic resources, using web resources, programming and coding, digital design, job search, subject research, and business research and skills

> *Starting a creative business can be very challenging when you start looking for potential clients. Having a free spot to log in, access WiFi, in a quiet setting, then working, is priceless.*
>
> Customer comment via survey

A   Business outcomes

As shown in Figure 23, 26% of respondents said that they had used the library's technology service(s) for at least one of the listed business activities. This proportion was consistent across all demographic groups examined.

B   Employment supported

For customers who engaged in business-related activities using the library's technology services, most did so to manage an existing business and perform business-related research (14% each of total respondents; see Figure 23). When asked about the number of people employed by their business, the vast majority (93%) responded that their business employed fewer than 20 individuals.

> *I work for a small nonprofit with no office space, so I use the library regularly as an office. The WiFi access allows me to find connection with others and the community by working in this space.*
>
> Customer comment via survey

figure 23   **Use of technology services for business-related activities**

Survey question: Did you use the technology service(s) to engage in any of the following activities?

I did not use the technology service(s) for any of...   **74%**
Manage an existing business   **14%**
Perform business related research   **14%**
Start a business   **8%**
Find potential customers   **7%**
Expand an existing business   **6%**
Find potential partners   **4%**
Find potential investors   **2%**

■ Overall respondents (1134)
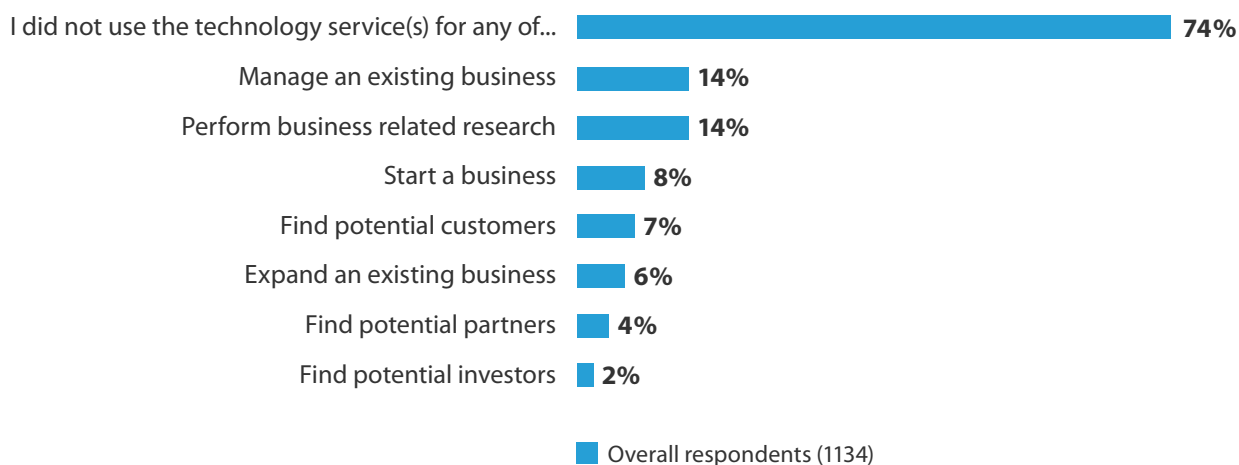
Secondary Outcomes | Workforce Development

As the final secondary outcome area, workforce development includes lifelong learning through technology (distinct from the primary outcome area of digital literacy, which involves learning about technology), as well as learning the skills necessary to compete in the job market. Technology services offered at public libraries help prepare job-seekers and emerging professionals for the workforce and connect them with employment and professional development opportunities.

The key performance indicators related to workforce development are:

A **Educational activities/lifelong learning:** Use of technology service(s) for educational activities (e.g., applying to enroll in a degree or certificate program, taking an online class or workshop)

B **Employable skills:** Use of technology service(s) to develop employable skills (e.g., management skills, administrative skills, technical skills, etc.)

C **Job search outcomes:** Use of technology service(s) to develop skills related to finding a job (e.g., accessing job boards, building a resume, preparing for an interview, etc., and success in finding a job)

In the pilot, the technology services linked to the workforce development outcome area were:

- WiFi Internet access at the library
- WiFi Internet access outside the library (after hours)
- Access to Internet at a library workstation
- Access to Internet through a borrowed WiFi Hotspot
- Laptops and/or tablets borrowed for general use (at the library or outside the library)
- Assistive technology equipment
- Electronics, circuitry and robotics (only applicable to educational activities and lifelong learning)
- Fabricating and manufacturing equipment
- Audio-visual production equipment
- Business-related software
- Content creation and editing software
- Classes and individual support related to accessing the library's electronic resources, using Microsoft Office software, using web resources, programming and coding, digital design, job search, subject research, using mobile devices, business research and skills, and social media (not applicable to educational activities and lifelong learning)

> *I come here every day to do my online school work. I don't have Internet at home.*
>
> Customer comment via survey

(A) Educational activities/lifelong learning

As shown in Figure 24, 64% of respondents said that they used the library's technology service(s) for educational activities. Younger customers (34 and younger), immigrants, and customers identifying as visible minorities were more likely to have used technology service(s) for educational purposes. Older customers (55 and older) were less likely to engage in these activities using library technology services.

As shown if Figure 25, when asked what educational activities they had engaged in using the library's technology service(s), the top answers were "completing coursework or homework," "taking an online class or workshop" and "learning about a degree or certificate program."

Younger customers were more likely to have completed coursework or homework using the technology service, while immigrants were more likely to have taken an online class or workshop.

64% of respondents said that they used the library's technology service(s) for **educational activities.**

figure 24 **Use of technology services for educational activities**
Survey question: Did you use the technology service(s) for educational activities?

	yes	no
Overall respondents (1130)	64%	36%
55 and older (223)	46%	54%
34 and younger (505)	75%	25%
Visible minority (345)	70%	30%
Immigrants (398)	73%	27%
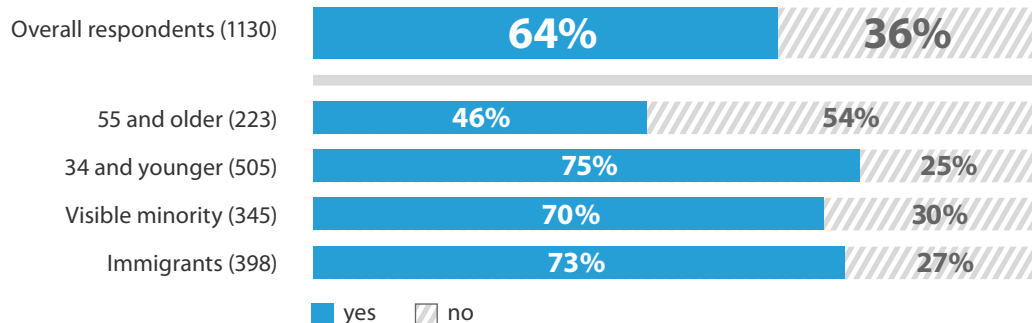
Younger customers (34 and younger), immigrants, and customers identifying as visible minorities were more likely to have used technology service(s) for educational purposes.

figure 25

Educational activities conducted using technology services

Survey question: If so, which activities? (follow-up question for "yes" responses presented in Figure 24)

Completing coursework or homework	53% / 67% / 53%
Taking an online class or workshop	34% / 31% / 41%
Learning about a degree or certificate program	34% / 33% / 38%
Taking a school-related test online	14% / 16% / 15%
Applying for a degree or certificate program	11% / 10% / 13%
Applying for student loans or scholarships	8% / 10% / 8%
Other	26% / 18% / 23%

■ Overall respondents (701)   ■ 34 and younger (366)
■ Immigrants (284)
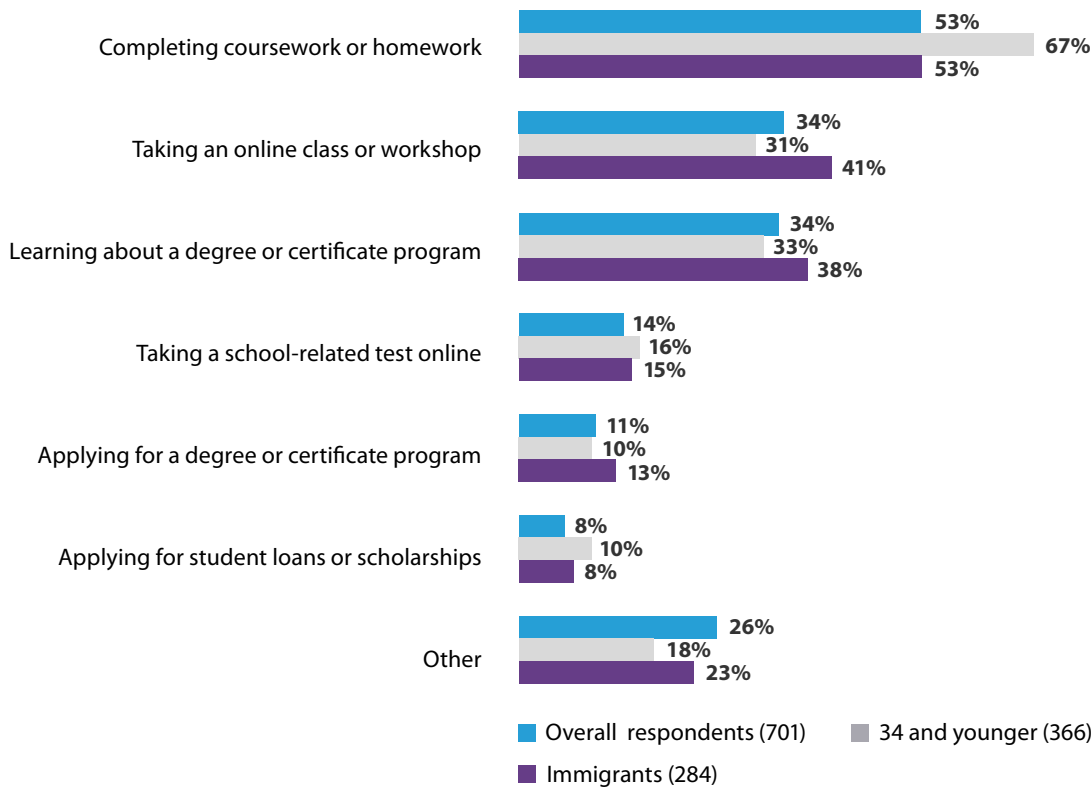
B ## Employable skills

Technology services related to workforce development can be used to develop and hone skills that increase a job-seeking customer's ability to compete in the job market and to qualify for certain positions. The survey revealed that 45% of customers used the related technology services for this purpose (see Figure 26). Younger customers and visible minorities were more likely to do so, while older customers were less likely, given the lower likelihood that they would be searching for a job in the first place.

When asked what skills they were able to develop using the library's technology services, 64% stated that they developed technical skills, while 34% said they developed management skills (see Figure 27). Immigrants were slightly more likely to have developed technical and management skills, as compared to the overall average.

figure 26

Use of technology services to develop employable skills

Survey question: Did you use the technology service(s) to develop employable skills?

Overall respondents (1122)
45% **55%**

55 and older (222)
24% **76%**

34 and younger (501)
51% **49%**

Visible minority (345)
52% **48%**

■ yes ▨ no
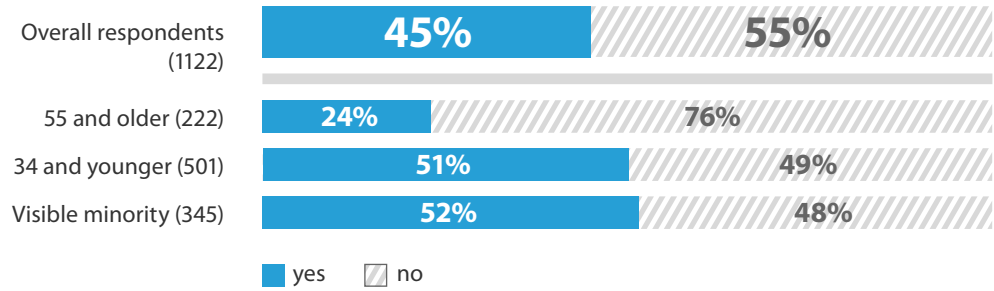
figure 27

Employable skills developed

Survey question: If so, which skills? (follow-up question to "yes" responses presented in Figure 26)

Technical skills
64%
66%

Management skills
34%
42%

Administrative skills
26%
29%

Sales/marketing skills
21%
22%

Other
15%
13%

■ Overall respondents (495) ■ Immigrants (189)
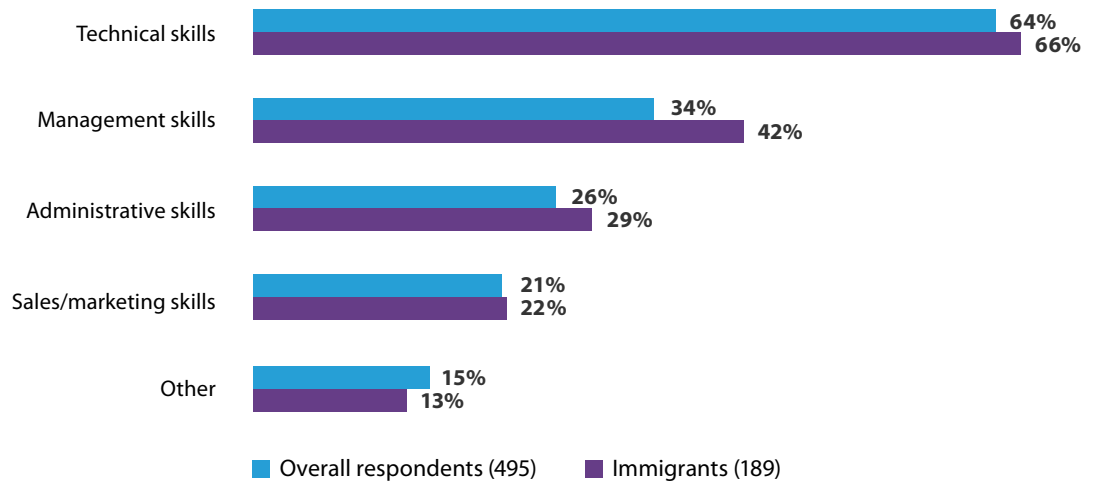
> *With the help of the Toronto Public Library WiFi service I improved my portfolio by updating one of my older projects and built technical skills useful for a software developer (PHP, Apache, Ubuntu Linux etc.). I also submitted several job applications.*
>
> Customer comment via survey

(C) Job search outcomes

The library can be a key resource for developing the skills related to searching for a job, as well as accessing resources related to job postings. The survey showed that of the 36% of respondents who used technology services related to workforce development did so to develop job finding skills (see Figure 28). This percentage was higher among immigrant customers, as well as those identifying as low income or a visible minority.

figure 28   **Use of technology services to develop employment skills**

Survey question: Did you use the technology service(s) to develop skills related to finding a job?

Overall respondents (1115)   **36%**   **64%**

55 and older (222)   **19%**   **81%**
Visible minority (345)   **44%**   **56%**
Immigrants (398)   **45%**   **55%**
Low income (470)   **47%**   **53%**

■ yes   ▨ no
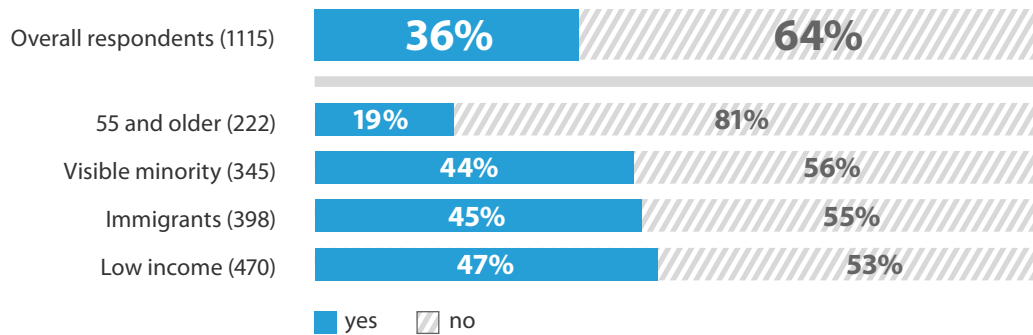
36% of respondents who used technology services related to workforce development did so to **develop job-finding skills**

> *I have been a member of the Toronto Public Library since I landed in Canada in February 2017. I am very thankful for the Internet service the library provides which helped me research and find a job when I had little access to Internet and wasn't able to afford a high-speed Internet for myself.*
>
> Customer comment via survey

When asked to provide more detail about the type of job search skills they developed, responding customers mostly said that they found information related to a job or profession or accessed job boards and listings (see Figure 29). Immigrants used library technology services to improve resume building and interviewing skills at a higher rate than average.

Survey results also showed that customers had a high level of success in finding a job when using the library's technology services for that purpose – 43% reported that they were successful in this regard (see Figure 30).

43% of respondents had a **high level of success in finding a job** when using the library's technology services for that purpose.

figure 29 **Employment skills developed**

Survey question: If so, in which of the following ways? (follow-up question to "yes" responses presented in Figure 28)

Finding information related to a job or profession
- 62%
- 63%

Accessing job boards and listings
- 61%
- 63%

Improving resume building skills
- 52%
- 59%

Improving interviewing skills
- 33%
- 44%

Other
- 8%
- 9%

■ Overall respondents (392)　■ Immigrants (172)
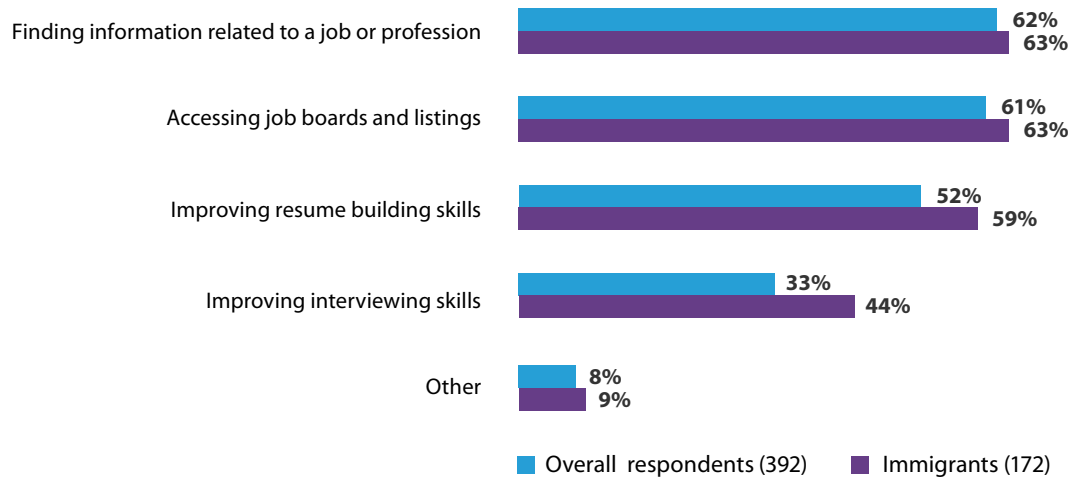
figure 30 **Customer success in finding a job**

Survey question: Were you successful in finding a job? (follow-up to "yes" responses presented in Figure 29)

| 43% | 57% |

Overall respondents (392)　■ yes　▨ no
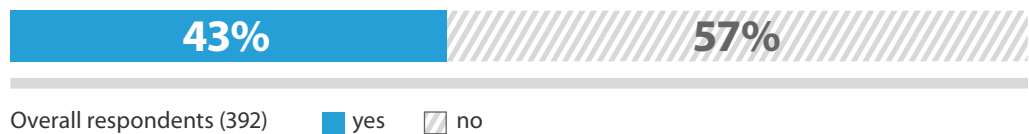
5. Awareness and Need for Library Technology Services

To enable library staff to better understand their customers' level of awareness and interest in various technology services, the Customer Survey asked respondents about technology services they had not used that were offered by the library system and why they had not used these services.

The pilot survey results revealed that several services with low levels of awareness and high levels of interest among customers are those that are highly specialized. For example, 35% of customers who had not used the library's content creation and editing software said that they were not aware that the library offered those services and would be interested in using them. The findings suggest that these services are in demand but could be better promoted by the libraries that offer them.

On the other hand, some services reported high levels of awareness – for example, Internet-enabled workstation – but showed little customer interest in using the services. This is consistent with other findings of the pilot.

As noted in Section II, one of the benefits of the pilot (and potentially the ongoing administration of the Customer Survey at Ontario libraries) is that it presents customers with a complete and up-to-date list of technology services offered by the library system. Therefore, the Customer Survey has the benefit of serving as a promotional tool, in addition to gauging the interest of customers in services they are and are not familiar with.

> *Until I took the survey, I was not aware of the services that the library has available. Perhaps, more info sessions or posters should be made available to let the public know of the library's technology resources.*
>
> Customer comment via survey

With more of a robust response base, this data can be analyzed by libraries for smaller groups of customers, either by demographic (e.g., age group, immigration status, or identification as a visible minority, an Indigenous person, or low income) or by location (i.e., using the first three-digits of postal codes to make decisions at a branch level). A better understanding of the demand for and awareness of each service can be essential to libraries in reallocating limited resources to ensure their technology services are meeting the needs of their customers.

IV. Conclusions and Considerations for Broader Rollout of *Bridge*

The pilot implementation of the Bridge Technology Services Assessment Toolkit demonstrated the potential of this solution to achieve several goals set out at the start of this project. Based on a combination of consultations, feedback and reports from participating libraries, and interactions with individuals involved in the rollout of the pilot at libraries across Ontario, it is evident that *Bridge* can:

- Help public libraries across the province deliver technology services more effectively by equipping them with the data and insights needed to make informed, evidence-based decisions and understand how their services are being used;

- Present a more accurate and complete picture of how technology services fulfill the mandate of public libraries to deliver effective and efficient service, and help libraries understand and demonstrate not only how technology services directly benefit residents of their communities, but how these services align with and support social and economic priorities at multiple levels of government;

- Compare the patterns and benefits in their communities to other libraries across Ontario, understanding the unique dynamics of their customers, benchmarking performance and sharing learnings with peers; and

- Contribute to the increased collective capacity of Ontario public libraries to deliver services that are responsive to the rapidly changing technology landscape, as well as the unique needs of their communities.

The pilot project has made significant strides toward the development of a practical and relevant solution, and in turn capacity building and advancement in the sector. However, the current iteration of *Bridge* should not be viewed as a final product. As larger volumes of data are entered into *Bridge*, further functionalities and usability features can be added to increase the effectiveness and value of the toolkit in helping libraries measure and plan their technology services. Looking forward to next year, the rollout of a refined *Bridge* toolkit to a wider group of Ontario libraries (i.e., a "beta" group of 30 to 50 library systems) would allow continuous improvement of the solution, driven by the needs of Ontario libraries.

> The pilot project has made significant strides toward the development of a practical and relevant solution, and in turn capacity building and advancement in the sector.

Key Learnings and Takeaways

The use of *Bridge*, or any other solution that involves the gathering and interpretation of data, requires a **basic level of comfort with, understanding of, and capacity to make sense of the data and insights generated.** To maximize the benefit of a tool such as *Bridge*, libraries in Ontario would need to increase their data collection and analytic capacity and skills. They may also need to enhance their ability to incorporate these processes into their broader organizational workflows. The future relevance and effectiveness of *Bridge* will depend on finding ways to collectively build capacity and skills for library staff.

It is valuable for public libraries to be able to compare the outcomes achieved by their technology services to all other users of *Bridge*, which in time will increasingly represent the variety of public library systems across the province. However, it was identified at the start of the project that the **option to compare to "like" libraries,** whether similar in size, community make-up, or geography, would provide a more relevant benchmark for many library systems. The size of the pilot was not large enough to allow the development and/or testing of more granular comparisons, and it is recommended that this feature be explored in the next round of modifications.

The scope of this project was to develop a toolkit that is relevant to and simple enough to be adopted by libraries of all sizes and resource capacities across Ontario. Through the course of the pilot, it became clear that larger, multi-branch libraries would benefit from a branch-level analysis to inform more targeted decision-making. It is recommended that the development of a **branch-level module** be explored upon the completion of (or in tandem with) the wider rollout.

> To maximize the benefit of a tool such as *Bridge*, libraries in Ontario would need to increase their data collection and analytic capacity and skills.

As noted in Section III, nearly all participating libraries faced challenges when using the **availability and usage statistics module** of *Bridge*. While the module was designed based on consultations with stakeholders and saw significant changes in functionality after the first pilot, there were major gaps in the completeness of data entered by library staff. These gaps were primarily due to the difference among library systems in the types of data that staff had access to (e.g., Internet usage data was not always available to the library directly), limited capacity to collect new data, and differences in the way technology services were offered across libraries (i.e., making it difficult to aggregate results in a meaningful way).

As a result of these challenges, it is recommended that this module be revisited after further consultations with a larger group of libraries, leveraging the learnings from this pilot. As successive versions of *Bridge* are rolled out, the aspiration is that all libraries will contribute to a common set of KPIs to establish and measure progress towards benchmarks for access and outcomes. The metrics will need to be updated on an ongoing basis to reflect the changing technology landscape as libraries continue to provide critical access to current and emerging technologies.

> As successive versions of *Bridge* are rolled out, the aspiration is that all libraries will contribute to a common set of KPIs to establish and measure progress towards benchmarks for access and outcomes.

It is also recommended that the Ontario Ministry of Tourism, Culture and Sport, which manages the annual collection of library statistics from across the province, be approached as a potential collaborator on the development of a final set of metrics that could be linked to the existing processes conducted by libraries as a requirement of continued provincial funding. The results of this pilot will be shared with the Ministry and across the public library sector so that the measures can be considered for province-wide adoption in the future.
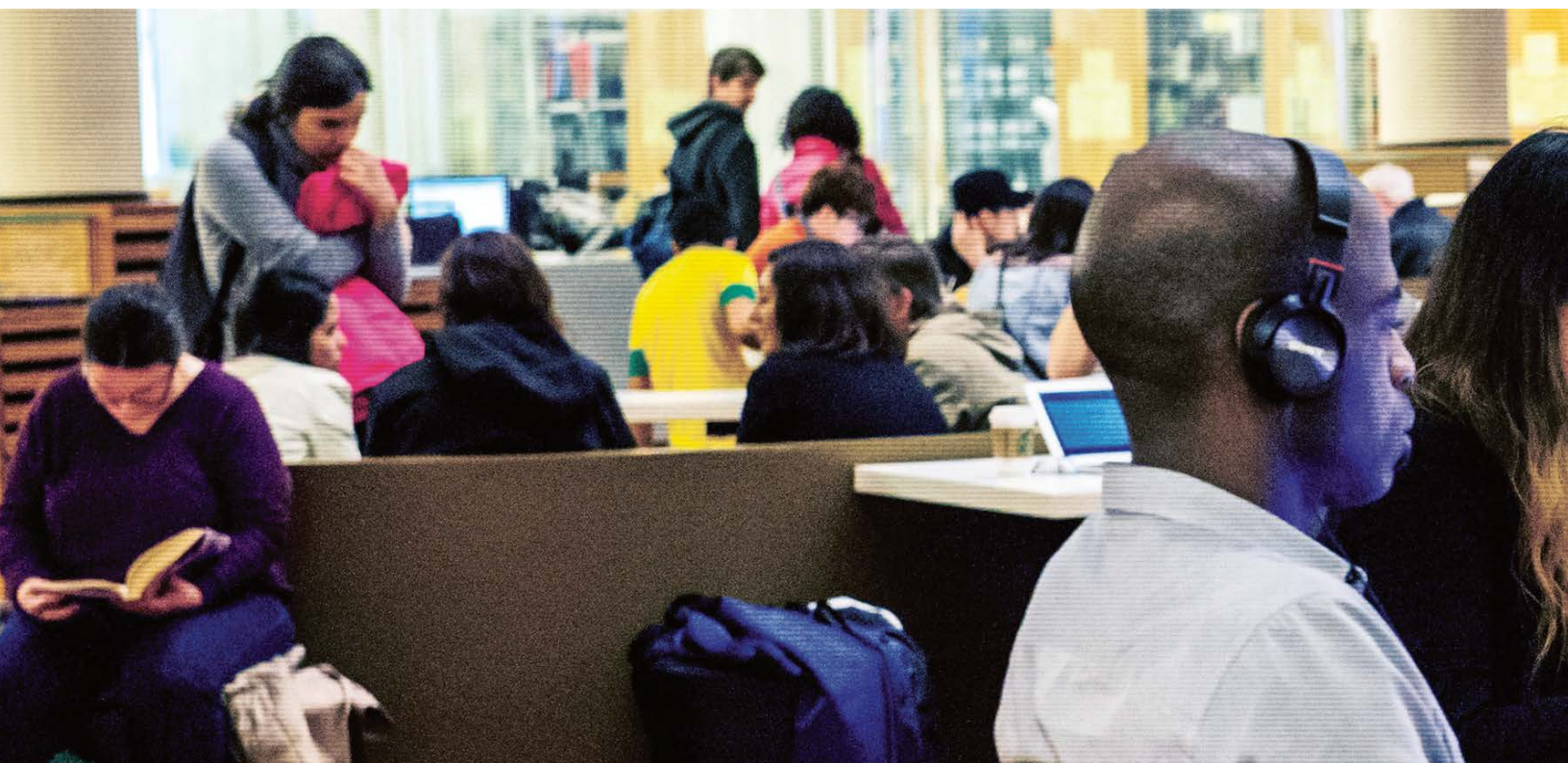
Future Outlook for the Bridge Technology Services Assessment Toolkit

The success of *Bridge,* and its ability to effectively support data-driven and evidence-based decisions around technology services, is dependent on its uptake. As more public libraries across the province begin to use *Bridge* to gather feedback, the sector as a whole will be better equipped to understand and deliver on the specific needs of the populations it serves. The full value of *Bridge* and its ability to support benchmarking can be maximized with a comprehensive uptake by all geographic regions across Ontario. More robust data sets would allow analysis based on more detailed demographics and geographies, as well as allow for cross-tabulation of customer groups to enable more detailed insights. With this data, Ontario public libraries will be able to target their programs and services to serve the unique needs of their communities and demonstrate the value of those services to funders and other stakeholders.

Bridge has the potential to position the public library sector as a leader in outcome-based analysis, serving as a leading example of advanced outcome measurement for peers in other jurisdictions, as well as across the culture sector and beyond. Even more importantly, *Bridge* gives libraries the tools to demonstrate and measure their value and impact as leaders in driving digital inclusion and digital literacy for their communities.

> *Bridge* has the potential to position the public library sector as a leader in outcome-based analysis, serving as a leading example of advanced outcome measurement for peers in other jurisdictions, as well as across the culture sector and beyond.

V. Key Terms and Definitions

Digital inclusion: How communities and individuals access the technological capacity to pursue economic and educational opportunities, and to participate in civic life.[10]

Digital literacy: The ability to use information and communication technologies to find, evaluate, create, and communicate information, requiring both cognitive and technical skills. [11]

Civic engagement: Citizen participation in the public realm, including through engagement with the electoral process, access to government resources and services, and involvement with non-profit groups and organizations.

Community and social engagement: The sense of belonging to community and/or social networks, as reflected by strong relationships with family and friends, participation in social activities, and connection to communities of shared interests and/or needs.

Technology Services: For the purposes of this report, technology services at public libraries include: connectivity services, technology equipment and facilities, digital literacy training and support.[12]

Connectivity Services

- **WiFi Internet access at the library:** Wireless Internet access (WiFi) connection at the library, including use of WiFi through customer's own device and/or through devices (e.g., laptops, tablets) borrowed from the library. Excludes use of Internet-connected workstations at the library.

- **WiFi Internet access outside the library (after hours):** WiFi connection used after hours, in the vicinity of the library building.

- **Access to Internet at a library workstation:** Library workstations to connect to the Internet.

- **Access to Internet through a borrowed WiFi Hotspot:** WiFi Hotspot that has been borrowed from the library to connect to the Internet at home or elsewhere.

Technology Equipment and Facilities

- **Laptops and/or tablets borrowed for general use (at the library):** Laptops and/or tablets that can be used at the library.

- **Laptops and/or tablets borrowed for general use (outside the library):** Laptops and/or tablets that can be borrowed from the library for use at home.

- **Devices used for entertainment:** Equipment or devices accessible to the public for entertainment. For example, gaming consoles, virtual reality headsets, e-readers, or tablets that are used to watch videos, etc.

- **Assistive technology equipment:** Equipment or devices accessible to the public dedicated to increasing, maintaining, or improving functional capabilities for individuals with disabilities. For example, dedicated computer workstations with accessibility support.

- **Electronics, circuitry and robotics:** Kits accessible to the public for electronics, circuitry and robotics. For example, Arduinos, Makey Makeys, Raspberry Pis, consumer robots (i.e. Sphero, etc.).

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[10] As drawn from the Edge Initiative, Edge Website "Edge: where people connect, communities achieve" (2016).

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[11] As defined by the American Library Association, ALA Connect Website, "Digital Literacy Definition" (September 14, 2012).

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[12] Technology services definitions were developed and refined through the pilot project process. Technology services and digital literacy training and their definitions offered by public libraries will evolve in response to the changing technology landscape and customer needs.

- **Fabricating and manufacturing equipment:** Equipment or devices accessible to the public for manufacturing, fabricating or publishing artifacts. For example, 3D printers, print-on-demand book machines, sewing machines, laser cutters, vinyl cutters, wood cutters, knitting machines. Excludes use of computers or tablets to support the digital design of the artifacts.

- **Audio-visual production equipment:** Equipment or devices accessible to the public for audio and/or video production. For example, cameras, camcorders and, DJ equipment, microphones, instruments. Excludes cords, cables, green screens, lighting, tripods or stands, computers or tablets to support recording of the content.

- **Microsoft Office software:** Full versions of Microsoft Word, Excel, PowerPoint and Publisher that have been installed on library workstations for public use.

- **Business-related software:** Business-related software, for accounting or management that have been installed on library workstations for public use.

- **Content creation and editing software:** Publicly accessible software that is installed on library workstations to create and/or edit creative content. For example, Adobe Creative Cloud, Z-Brush, Logic and Final Cut Pro. Excludes Microsoft Office products, freeware, or open source software.

Digital Literacy Training and Support
(Including formal one-on-one support and structured classes/workshops)

- **Basic computer skills:** Sessions on computer basics, mousing, keyboarding, etc.

- **Email:** Sessions on web-based email programs.

- **Accessing the library's electronic resources:** Sessions on how to use the library catalogue, access the library's ecollections (such as ebooks, eaudiobooks, magazines, online music and movies) and elearning computer courses, etc.

- **Internet safety:** Sessions on Internet safety and digital privacy.

- **Using Microsoft Office software:** Sessions on how to use Microsoft Office programs, including Word, Excel, PowerPoint, Publisher, etc.

- **Social media:** Sessions on how to use social media platforms such as Facebook, Twitter, YouTube, blogging, etc.

- **Using web resources:** Sessions on how to use the Internet including resources, advanced searching, government services, online images and maps, and cloud-based software (e.g., Google Drive), etc.

- **Programming and coding:** Sessions on web design, HTML, CSS, and coding.

- **Digital design:** Sessions on how to use software equipment related to content creation and editing software, fabricating and manufacturing equipment, audio-visual production equipment and electronics/circuitry and robotics.

- **Job search:** Sessions on how to use online resources for career development, training and finding a job.

- **Subject research:** Sessions on conducting subject-oriented research, researching a topic using a database or accessing a collection such as genealogy, maps, local history, science, computers, picture collection, etc.

- **Mobile devices:** Sessions on how to effectively use smartphones, tablets, iPads, etc.

- **Business research and skills:** Sessions on how to conduct market research, launch your business online, use social media for small business, and use databases to research demographics, market trends and other small business topics.

Appendix A: Technology Services and Related Framework used in the Pilot

Charts A and B summarize how each technology service relates to the outcomes and its respective key performance indicators (KPIs) before and after the pilot. The linkages were used to create customer survey questions.

Chart A – Framework used in the Pilot

Outcomes	KPIs	WiFi Internet access at the library	WiFi Internet access outside the library (after hours)	Access to Internet at a library workstation	Access to Internet through a borrowed WiFi Hotspot	Laptops/tablets borrowed for general use (at the library)	Laptops/tablets borrowed for general use (outside the library)	Devices used for entertainment	Assistive technology equipment	Electronics, circuitry and robotics	Fabricating and manufacturing equipment	Audio-visual production equipment	Microsoft Office software	Business-related software	Content creation and editing software	Basic computer skills	Email	Accessing the library's electronic resources	Internet Safety	Using Microsoft Office software	Social media	Using web resources	Programming and coding	Digital design	Job search	Subject research	Mobile devices	Business research and skills
Primary Outcomes — Digital Inclusion	Access to Technology	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆													
Digital Inclusion	Use for Others	◆	◆	◆	◆	◆	◆		◆	◆	◆	◆	◆	◆	◆													
Digital Inclusion	Digital Comfort				◆											◆	◆		◆	◆							◆	
Digital Literacy	New Technology Adoption				◆					◆	◆	◆			◆												◆	
Secondary Outcomes — Community, Social and Civic Engagement	Civic Engagement	◆	◆	◆	◆	◆	◆		◆	◆							◆	◆			◆	◆					◆	
Community, Social and Civic Engagement	Social Engagement	◆	◆	◆	◆	◆	◆	◆	◆	◆							◆	◆			◆	◆					◆	
Community, Social and Civic Engagement	Access to eGovernment	◆	◆	◆	◆	◆	◆		◆									◆				◆					◆	
Creativity and Innovation	Making Creative Products									◆	◆	◆			◆								◆	◆				
Entrepreneurship and Business Development	Business Outcomes	◆	◆	◆	◆	◆	◆		◆		◆	◆		◆	◆			◆				◆	◆	◆	◆	◆		◆
Entrepreneurship and Business Development	Employment Supported	◆	◆	◆	◆	◆	◆		◆		◆	◆		◆	◆			◆				◆	◆	◆	◆	◆		◆
Workforce Development	Educational Activities	◆	◆	◆	◆	◆	◆		◆	◆	◆	◆	◆	◆	◆			◆		◆		◆	◆	◆	◆	◆	◆	◆
Workforce Development	Employable Skills	◆	◆	◆	◆	◆	◆		◆			◆	◆	◆	◆			◆		◆	◆	◆	◆	◆	◆	◆	◆	◆
Workforce Development	Job Search Outcomes	◆	◆	◆	◆	◆	◆		◆		◆	◆	◆	◆	◆			◆		◆	◆	◆	◆	◆	◆	◆	◆	◆

Column groups: **Connectivity** (WiFi Internet access at the library … Access to Internet through a borrowed WiFi Hotspot); **Equipment and Software** (Laptops/tablets borrowed for general use (at the library) … Content creation and editing software); **Digital Literacy (Technology Classes/Support)** (Basic computer skills … Business research and skills).

Chart B – Revised Framework based on Pilot Feedback

		Connectivity				Equipment and Software										Digital Literacy (Technology Classes/ Support)													
Outcomes	KPIs	WiFi Internet access at the library	WiFi Internet access outside the library (after hours)	Access to Internet at a library workstation	Access to Internet through a borrowed WiFi Hotspot	Laptops and/or tablets borrowed for general use (at the library)	Laptops and/or tablets borrowed for general use (outside the library)	Devices used for entertainment	Assistive technology equipment	Electronics, circuitry and robotics	Fabricating and manufacturing equipment	Audio-visual production equipment	Microsoft Office software	Business-related software	Content creation and editing software	Basic computer skills	Email	Accessing the library's electronic resources	Internet Safety	Using Microsoft Office software	Social media	Using web resources	Programming and coding	Digital design	Job search	Subject research	Mobile devices	Business research and skills
Digital Inclusion (Primary) — Access to Technology	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
Use for Others	◆		◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆													
Digital Literacy (Primary) — Digital Comfort	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
New Technology Adoption			◆	◆	◆	◆	◆	◆	◆	◆	◆	◆		◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
Community, Social and Civic Engagement (Secondary) — Civic Engagement	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆		◆		◆	◆		◆		◆	◆	◆	◆	◆	◆	
Social Engagement	◆	◆	◆	◆	◆	◆	◆	◆	◆		◆	◆		◆	◆	◆	◆		◆	◆	◆	◆		◆	◆	◆	
Access to eGovernment	◆	◆	◆	◆	◆	◆		◆				◆			◆	◆			◆		◆	◆		◆	◆	◆	
Creativity and Innovation (Secondary) — Making Creative Products	◆	◆	◆	◆	◆	◆		◆	◆	◆	◆	◆		◆								◆	◆		◆	◆	
Entrepreneurship and Business Development (Secondary) — Business Outcomes	◆	◆	◆	◆	◆	◆				◆		◆	◆	◆			◆	◆	◆	◆	◆	◆	◆		◆	◆	◆
Employment Supported	◆	◆	◆	◆	◆	◆			◆	◆	◆	◆	◆	◆			◆	◆	◆	◆	◆	◆	◆		◆	◆	◆
Workforce Development (Secondary) — Educational Activities	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆		◆	◆	◆	◆	◆	◆	◆	◆		◆	◆	◆
Employable Skills	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆		◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
Job Search Outcomes	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆		◆	◆		◆	◆	◆		◆	◆	◆	◆	◆

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