

McMaster Digital Transformation Research Centre

Local Community Digital Literacy Training

An Exploratory Investigation of Digital Literacy Training Programs Led by Public Libraries and Other Local Community Organizations

McMaster Digital Transformation Research Centre (MDTRC)
DeGroote School of Business

MDTRC Working Paper No. 102

October 2020



Local Community Digital Literacy Training



An Exploratory Investigation of Digital Literacy Training Programs Led by Public Libraries and Other Local Community Organizations

by

Brian Detlor, Ph.D., McMaster University

Heidi Julien, Ph.D., SUNY at Buffalo

Tara La Rose, Ph.D., McMaster University

Alexander Serenko, Ph.D., Ontario Tech University

October 2020

Abstract

This working paper describes an exploratory research investigation of the factors affecting the success of digital literacy skills training offered by local community organizations, such as public libraries. The study investigates how public libraries and other community-based organizations can best deliver the digital literacy initiatives they provide to the communities they serve. Case studies of two public libraries and five community organizations in the Greater Toronto and Hamilton Area (Canada) were carried out. Data collection comprised: a) one-on-one interviews with administrators, instructors, and people who received training; b) the analysis of training documents; c) observations of training sessions; and d) a survey administered to clients who participated in these training sessions. Qualitative data analysis techniques identified a variety of factors that shape digital literacy training success. These factors include: i) organizing and training staff; ii) acquiring sustainable funding; iii) reaching marginalized populations; iv) offering training at convenient times to end-users; v) marketing the training; vi) sharing and adopting best practices; and, vii) collecting and analyzing performance measurement data. How these factors inter-relate, and how these factors differ between different types of end-users and different types of local community organizations were explored. From these findings, recommendations for practice on how to run successful digital literacy training programs are provided. Ultimately, the factors identified in this study will guide the development of several survey instruments that will be administered to public libraries (both administrators and clients) across Canada in order to gain not only a national picture of digital literacy initiatives offered by public libraries and other community organizations, but also to better understand how organizational and end-user considerations surrounding these initiatives impact digital literacy training success.

Keywords: Digital Literacy, Training, Public Libraries, Community Organizations

Acknowledgements: This paper was kindly supported by a Partnership Development Grant (PDG) from the Social Sciences and Humanities Research Council of Canada (SSHRC). Partner organizations on the PDG comprised Hamilton Public Library (HPL), the Canadian Urban Libraries Council (CULC), the Canadian Federation of Libraries Association (CFLA), and McMaster University's Office of Community Engagement. Thanks goes to the following Research Assistants whose help during the data collection and analysis process greatly facilitated the production of this work: Hannah Barrie, David Gerstle, Jodie Lobana and Mona Nasery. Thanks also goes to those who agreed to serve as research participants.

Table of Contents

1. Introduction	1
2. Methodology	3
3. Findings	7
4. Discussion.....	26
5. Conclusion	29
6. References.....	30
Appendix A – Interview Questions - Administrators	32
Appendix B – Interview Questions – End-Users.....	34
Appendix C – Interview Questions - Instructors	35
Appendix D – Demographic Questionnaire	38
Appendix E – Initial Code Book - Administrators	40
Appendix F – Initial Code Book – Instructors and End-Users.....	42

1. Introduction

This paper outlines an exploratory investigation of the factors affecting the success of digital literacy training initiatives run by local community organizations, including public libraries.

Digital literacy is defined as “the set of skills, knowledge and attitudes required to access, create, use, and evaluate digital information effectively, efficiently, and ethically” (Julien, 2018, p. 2243). It is the ability of people to locate, organize, understand, evaluate, and create information using digital technology (Bawden, 2001; Gilster, 1997). Digital literacy comprises two sets of broad skills: i) skills to operate and utilize digital technologies such as computers, tablets and smart phones; and ii) skills to access, create, use, and evaluate digital information (Detlor, 2018).

Nowadays, people need sufficient digital skills to operate digital devices, and critically assess the information provided by these devices. Those who possess such skills are considered digitally literate. Being digitally literate leads to more positive health outcomes (as people are more able to access high quality health information online), better access to government services, greater participative governance, improvements in workforce development (improved job performance, employment), and the bridging of the digital divide (Julien, 2018).

Overall, digital literacy in Canada is lacking (Hadziristic, 2017). Although digital literacy is recognized as a key component of Canada’s digital talent strategy (ICTC, 2016), Canada does not have a digital literacy strategy currently in place to support digital literacy training in K-12 and post-secondary education, nor in on-the-job training/upskilling. However, a national digital literacy strategy is on the federal government’s radar and work towards a national digital literacy strategy is in progress (Innovation, Science and Economic Development Canada, 2019a). For example, the federal government’s Digital Literacy Exchange Program is an initiative to support not-for-profit organizations in the delivery of digital literacy training initiatives for Canadians who need improved skills and confidence in using computers and the Internet. The goal of this program is to enable all Canadians to participate in – and benefit from – a connected and digitally engaged society (Innovation, Science and Economic Development Canada, 2019b).

Canadian public libraries play an important role in digital literacy promotion in the communities they serve. These institutions have developed and delivered digital literacy programs to all Canadians

(including under-represented groups) and have been providing safe, secure, and effective Internet and computer use since the advent of the World Wide Web (Julien & Hoffman, 2008; Julien & Breu, 2005). Examples of such community-based programs offered by Canadian public libraries include training in basic computer skills, email use, mobile device use, software operation (e.g., Word for Windows and Google), Web resource use, access to library and government electronic resources, Internet safety, digital privacy, social media use, job search skills, business research skills, and computer programming. Providing these programs is now a core public library service (Cole & Ryan, 2016; Takala, 2018), as well as a service offered by a range of other community-based organizations, such as the YWCA, local industry education councils, community colleges, municipal information and community service departments, boards of education, city social planning and research councils, and small business enterprise centres. There is recent evidence that such programs delivered by public libraries in Canada promote digital literacy, increase digital comfort, and encourage the adoption and use of digital technologies (Nordicity, 2018).

Importantly, public libraries and other community-based organizations play a key role in the promotion of digital literacy skills. Public libraries, in particular, have embraced an evolving role as digital literacy and inclusion centres and have become important community hubs; understanding and sharing local evaluation and research findings on digital literacy initiatives led by public libraries is an excellent way to leverage best evidence-based practice in this area (Cole & Ryan, 2016). According to a report by the Pew Research Centre, the public wants libraries to teach digital literacy; library efforts can help the most vulnerable groups in this regard (Horrigan, 2015). Public libraries and other community-based organizations should offer programs to teach people, including children and senior citizens, how to use digital tools such as computers, smartphones and apps, and how to protect their privacy and security online. There is a strong connection between library support of digital literacy skills and employment. Contributions to the economic health of communities and the economic success of individuals are major reasons why public libraries should teach digital skills (Horrigan, 2015; Public Library Association, 2020).

Given this context, a study investigating the factors affecting the success of digital literacy training initiatives run by local community organizations, including public libraries, is important because people need to be digitally literate in order to fully participate and thrive in today's society. How best to offer such training is crucial to understand. This is especially true of local community organizations, such as public libraries, that wish to deliver digital literacy training to community members who may have no

others means by which to receive such instruction. This training includes digital storytelling workshops, coding clubs for youth, and iPad training sessions for seniors, for example.

The overarching research question guiding this study is two-fold:

- “What factors affect the success of digital literacy training led by local community organizations?” and, given these factors,
- “How can local community organizations best deliver the digital literacy initiatives they provide to the communities they serve?”

Answers to such questions will yield not only theoretical insights but also offer recommendations for practice about how to run successful digital literacy training events for local communities.

2. Methodology

To answer the study’s research questions, a variety of local community organizations were approached. In the end, two local public libraries and five other local community organizations who deliver digital literacy training agreed to participate in the study. Non-library community organizations involved two types of organizations: i) not-for-profit organizations (e.g., a local industry education council, the Kiwanis Boys and Girls Club, and a Mathstronauts training program); and, ii) community research organizations interested in launching their own digital literacy programs and assessing the efficacy of these programs.

Data were collected in a variety of ways. The first was through one-on-one interviews held with 14 administrators, six training instructors, and 23 end-users (local community members) who attended training programs. End-users and instructors were given a \$10 Tim Hortons gift card for their participation as an incentive to participate in the study. No compensation was given to administrators for their participation.

In terms of administrators, 11 were women and three were men. Titles of these individuals typically consisted of “Director”, “Manager”, “Chief Librarian”, “Program Manager” and “Policy Analyst”. With respect to training instructors, two were women and four were men. The 23 end-users who participated in the study formed a diverse sample, although most comprised two specific sub-samples: i) youth between 7 to 12 years of age, and ii) older adults between 54 and 82 years of age. Of these 23 end-

users, eight were women and 15 were men. See the table below for demographic details about the end-users who participated in this study.

Participant ID	Age	Gender	Education
22	62	Woman	UG
23	82	Woman	Graduate
24	74	Woman	UG
25	60	Man	Graduate
27	73	Woman	College
28	72	Man	High School
29	69	Woman	High School
30	71	Woman	Graduate
31	54	Man	College
32	7	Man	Elementary
33	8	Woman	Elementary
34	9	Man	Elementary
35	12	Man	Elementary
36	10	Man	Elementary
37	10	Man	Elementary
38	10	Man	Elementary
40	76	Man	UG
41	70	Man	Graduate
42	73	Man	College
43	58	Woman	College
46	60	Man	High School
47	40	Man	High School
48	30	Man	College

Activity Theory (Engestrom, 1987; Leont'ev, 1981, Vygotsky, 1978) guided the formation of interview questions posed to administrators concerning organizational factors that affect successful digital literacy training. See Appendix A for the interview guide that was used.

Detlor et al.'s (2011) model of Information Literacy Instruction Factors Affecting Student Learning Outcomes and Serenko et al.'s (2012) model of Student Learning Outcomes of Information Literacy Instruction guided the formation of interview questions posed to people who took part in a training session. These questions asked interviewees to reflect upon the learning environment and program

components of their training sessions, as well as the outcomes of the digital literacy instruction received (i.e., psychological, behavioural, benefit outcomes). See Appendix B for a list of questions posed to end-users who received digital literacy training.

The interview questions asked of instructors were a combination of questions from the administrator and end-user interview guides. See Appendix C for the interview script used for instructors.

All interviews, except one end-user interview, were digitally recorded and later transcribed. For that one interview that was not digitally recorded, hand-written notes were taken in lieu. Interviews with administrators and instructors averaged between 45 and 60 minutes in length. Interviews with end-users who took part in a training session lasted between 5 and 15 minutes on average.

Prior to the interviews with end-users, participant observations of the training sessions these end-users attended were conducted. Two members of the research team were present at each session. Each team member took independent notes during the training session. The notes recorded impressions of the physical environment, the content being taught, how it was taught, reactions from the people taking the training, the mood of the room etc. The following table lists the title of the six training sessions observed.

Title of Training Session
Build a Video Game with Bloxels
Creating a Holiday Postcard
Digitize Your Memories
Introduction to the WWW
MicroSoft Word Advanced
MicroSoft Word Basics
Searching with Google

Immediately after a training session occurred and prior to the interview sessions with end-users, a paper questionnaire was administered individually to each end-user who agreed to participate in the study. This questionnaire collected basic demographic information (e.g., age, gender, education), as well as end-user self-perceptions of comfort, confidence, and efficacy using new information technologies (see Appendix D).

Last, documents were collected from administrators and instructors that pertained to the training initiatives being investigated (e.g., project charters, training materials, recruitment messages).

Dedoose, a qualitative data analysis software tool, was used to store all data collected in the study (e.g., interview transcripts, researcher observation notes, training documentation). In total, 76 media files were loaded into Dedoose. Four sets of descriptors in Dedoose were set up: i) participants; ii) organizations; iii) roles; and iv) training sessions. A unique participant ID was created for each participant in the study. Each participant was assigned to one specific organization and one role. Each organization was allocated a unique organization ID and was assigned to one of three organization types (library, community not-for-profit, community research). There were three possible roles a participant could be assigned: administrator, instructor, or local community member (end-user). Each training session observed by the research team was assigned a unique training session ID. Attributes associated to each unique training session included the title of the training, the participant ID of the instructor who taught the session, the date of the training, and the location of the training.

This set-up in Dedoose was very useful in looking at individual cases (from both organizational and end-user perspectives) and delving deep into differences among users (in terms of age, gender, etc.) and into differences among different organizational types (i.e., libraries, community not-for-profit, and community research organizations).

Qualitative data analysis methods advocated by Miles et al. (2014) and Charmaz (2014) were used to explore and identify categories and themes in the data. This approach was inductive and exploratory in nature, rather than to test or validate pre-conceived notions. This approach assumed that the opinions and reflections of both researchers and participants help constitute a shared understanding and interpretation of the phenomenon under investigation.

Two rounds of in-depth coding were conducted. The first round involved the creation of a code book for administrators (see Appendix E) and a separate code book for instructors and end-users (see Appendix F). These code books were based on sensitizing concepts from theories identified above used to structure interview questions. The administrator code book had codes reflecting training offered by an organization *in general*, and with *specific* training programs. The instructor/end-user code book had codes that reflected a *specific* digital literacy training program or session only. Despite the use of two

code books to guide the initial coding of the data in this first round, the researchers also freely created new codes “in vivo” (i.e., on the fly) during the first round of analysis.

From this first round, an initial set of factors affecting digital literacy training success were identified. These factors were: i) organizing and training staff; ii) acquiring sustainable funding; iii) reaching marginalized populations; iv) offering training at convenient times to end-users; v) marketing the training; vi) sharing and adopting best practices; and, vii) collecting and analyzing performance measurement data.

The second round of data analysis went further into exploring these factors. This involved examining how these factors inter-relate, and how these factors differed between groups. This involved looking at differences across types of organization delivering the training (e.g., libraries vs. other community organizations), types of training (e.g., advanced vs. basic), governance approaches, and target audiences (youth vs. seniors). This also involved looking at how the characteristics of a digital literacy training session affects end-user perceptions of the training, as well as end-user confidence and interest in using new information technology in the future, as a result of participating in a training session. Differences between youth and older adults, and between men and women, were specifically analyzed.

To facilitate this second round of analysis, weekly meetings were held by members of the research team to discuss findings identified during the current week, issues that may have resulted in conducting the data analysis, and goals for next week’s data analysis activities.

3. Findings

As mentioned above, three types of organizations were investigated in this study: i) public libraries, ii) community not-for-profit organizations, and iii) community research organizations. Public libraries in this study offered a wide spectrum of both basic and advanced digital skills training to the public. Basic skills training focused on how to use social media, surf the Internet, or use MS Word. Advanced skills training consisted of courses such as HTML/XML coding and website design. Community not-for-profit organizations recruited for this study tended to target young people, specifically K-12. Emphasis was placed on providing computer programming training and running special events such as a hackathon, where participants could earn certificates/scholarships. Community research organizations in this study

tended to focus on more advanced training (e.g., Artificial Intelligence) and to target multiple age groups and demographic segments, especially under-represented populations.

Administrators and instructors interviewed for this study, across all organizational types, described four categories of success in the delivery of digital skills training:

- Improvement of community members' general understanding of the role and importance of information technology in their daily lives.
- Increased digital skills development of community members, especially among under-represented groups (i.e., marginalized populations).
- Evidence of positive life outcomes (e.g., increased confidence; application of skills learned to new jobs/education, hobbies) from people who take the training.
- Healthy statistics in the number of people who take digital skills training courses and become recurring participants in future training sessions offered by the organization.

Recall that two rounds of qualitative data analysis were conducted. The first round of data analysis elicited a list of salient factors that affect the success of digital literacy training initiatives led by local community organizations. These factors include: i) organizing and training staff; ii) acquiring sustainable funding; iii) reaching marginalized populations; iv) offering training at convenient times to end-users; v) marketing the training; vi) sharing and adopting best practices; and, vii) collecting and analyzing performance measurement data. The second round of analysis examined how these factors inter-relate, and how these factors differed between groups.

In terms of ***organizing and training staff***, many factors were identified. For public libraries, often the problem is training. Staff are generally willing to participate, but there is little time to train staff because other duties take precedence. Further, some library staff have little interest in digital skills training. As one participant noted,

- *"The role of the librarian is changing to become more digital-savvy. Some staff members [longer-term staff] are in denial and are resistant to this change."*

One instructor spoke about the disconnect between the goals of higher levels of governance and the actual abilities of library staff. The primary challenge, according to some instructors, is the changing role of the librarian and the need for staff to be adequately trained to teach digital skills. This challenge was expressed in terms of the difficulty of a changing role overall, as well as the difficulty of varying staff skills and comfort level with technology, and staff knowledge of teaching/pedagogy. The following interview excerpts highlight these points:

- *“None of us are programmers.”*
- *“We also have to recognize that library staff members cannot be expected necessarily to be teachers.”*
- *“There’s always pushback from staff who say, well I don’t know that particular skill, or how can I be expected to learn all these things.”*

Scheduling was also mentioned as a challenge for instructors in public library settings. The traditional “nine-to-five” workday is difficult for providing digital skills training courses that are accessible to a wider range of communities.

To alleviate these scheduling and training issues, public libraries are partnering with external organizations, particularly technological savvy ones such as Google and Cisco Networks, to provide training programs that community members need and want, as the following interview excerpts illustrate:

- *“[We] entered into a partnership with CISCO about three or four years ago, and at that time they did not know where it was going to go. As a public library, [we] knew we needed to partner with an organization that was technically savvy, as this was expertise that was lacking within the library. It started with conversations. As they talked, the idea of being able to teach library patrons advanced digital skills came up.”*
- *“[We] had a relationship with Google through the Wi-Fi hot-spot lending initiative. Google funded this for 3 years and the city matched this funding. The Wi-Fi hot-spot worked with Rogers... that way people could borrow a hardware device and take it home for 6 months and*

get Wi-Fi (Internet) access at home (which they did not have before). Up to 5 or 6 members of a family (who could not afford it) could have Wi-Fi at home. This program was targeted to low-income families. This was [our library's] first instance with working with Google. A relationship was established."

Despite these partnerships, public library administrators still struggle with the timing of digital training programs. In summertime, community members have other obligations, while in winter, people tend not to go out. In response, public libraries often leave the selection of what digital skills training to provide and when to provide them up to local branches to decide, as different local branches comprise different local populations and end-user needs. This is reflected in the following interview excerpt:

- *"So far, we leave the branches to choose what program. So, we say, "Hey, here is the potential programs that can be offered." And then each branch will say, "Yeah. I'll pick up those two because my community, whatever."*

Training issues were also identified by community research organizations. Specifically, they are challenged by a need to employ staff who are highly digitally literate and trained from the start. Community research organizations seem to require a high degree of organization and governance to develop curriculum and implement it through instructors. They also require a good deal of collaboration between instructors to keep this curriculum consistent.

Likewise, training is a concern for community not-for-profit organizations. This is particularly true with respect to keeping and paying instructors. There is a need to incentivize instructors to stay, as well as encourage them to form lasting relationships with students. According to interviewees, the biggest challenge for community not-for-profit organizations is keeping and paying instructors, who are mostly graduate students. These organizations need to incentivize their instructors in order to retain them and form long-standing relationships with students. The following interview excerpts exemplify these points:

- *"[Challenges include] finding qualified people to do it. Finding people who are going to be consistently around. Because part of it is relationship building especially when it comes for delivering programs for anybody, any population but particularly for youth. Because part of the reason they come is because they've built a relationship with the person who's delivering the programs. And if that's continuously changing, they drop off. Having access to facilities and*

space that's appropriate for these kinds of things can be a challenge. Sometimes as much as community partnerships are important.”

- *“It has to be the right people who can reach youth and provide the right types of incentives and the right approach at engaging people to come and do their homework. Like that's a tough sell for a high school group.”*
- *“The reason that we've had trainers from the outside come and actually deliver the program is because within we had a hard time finding people who are qualified to do this. Because they have certain criteria for -- so they have to be their student or graduate or something within like computer sciences or whatever. And that can be difficult to find when people are not wanting to work for certain wage for example.”*

Similar to public libraries, community not-for-profit organizations struggle with timing their programming (e.g., afterschool programs may work for younger students, but older youth have other responsibilities).

All organizations that participated in this study reported that the target audience for training was broad. Some training sessions are for a general audience, while others cater specifically to certain groups, such as older adults, newcomers, school groups, girl guides, youth, adults, etc.

Instructors interviewed for this study commented on the need for additional staff training and that such training for instructors is a necessary component of the changing role of the digital literacy instructor. Instructors spoke about senior management needing to better understand the importance of providing sufficient training for instructors to provide high quality instruction to local community members.

Certain challenges confront instructors when planning training sessions. Challenges include a lack of knowledge of participants' current skill levels, teaching participants who have English as a second language, and the constant need to increase or repurpose spaces for new hardware (e.g., maker spaces and virtual reality technology). Though one of the public libraries involved in this study provided templates of instruction (i.e., centralized development of curriculum templates such as PowerPoint slides and worksheets that were then administered by instructors to implement as they saw fit), instructors commented that there was a lack of sharing between instructors about how best to deliver a particular curriculum. More knowledge-exchange between instructors is needed.

Community research organizations also reported issues with organizing and training staff. One of their significant challenges is attracting and maintaining instructors, who may be working through graduate school and are able to commit to instruction on short timelines. These instructors need to be trained and ready before the courses begin. To mitigate this challenge, community research organizations have the benefit of partnering with stakeholders from academic communities to deliver digital skills training programs. Interestingly, public libraries, like community research organizations, are increasingly relying on university partnerships to gain insight on how to best deliver digital skills training and how to share best practices among library practitioners and university researchers interested in digital skills training.

With respect to ***acquiring sustainable funding***, a lack of funding was a common theme elicited by administrators during their interviews about the future sustainability of digital skills training programs. One community not-for-profit administrator succinctly pointed out that *“the life of the program is the life of the grant,”* implying that external grant funding, while appreciated, makes a digital skills training program largely dependent on funding. With respect to community research organizations, the capacity to develop programs/curriculum is very much dependent on external funding. Sometimes, creativity is needed:

- *“We are looking for other funding which I'm sure I'm confident we'll find in a variety of ways. So, we've been developing this really sort of intensively over the last... really over the last three months probably. And we're submitting a proposal to Future Skill Centre. Because we see the real link between what we're trying to do and what they're trying to accomplish.”*

One community not-for-profit organization commented on how a large telecommunications company in Canada (Rogers) was pivotal in supplying funding to them:

- *“[Our organization] has had a partnership with Rogers... they have internally assisted in developing programs that are appropriate for us. Internally, we developed [a digital skills training program for high school students] ... and kind of shopped it out to different funders. Rogers came onboard and funded it for up until three years ago. Now we have a different funder. So, based on kind of the model and what they came up with Rogers just came on board and wanted to contribute to high school graduation rates across Canada.”*

Among public library administrators, the threat of municipal or city governments cutting off dollars or reducing budgets was mentioned as a significant threat to delivering digital skills training to the public.

Regarding ***reaching marginalized populations***, analysis of the interview data from administrators highlighted the importance of providing digital skills training to marginalized populations (e.g., newcomers, disadvantaged youth, the unemployed, older adults). The skills training provided to these marginalized communities are broad. This includes, but is not limited to, training in basic computer skills, email use, mobile device use, software operation (e.g., Google; MS Office), Web resource use, access to library and government electronic resources, Internet safety, digital privacy, social media use, job search skills, business research skills, and computer programming.

Importantly, many of these training programs are quite innovative. For example, public libraries are partnering with large technology companies (like Google and Cisco Networks) to provide digital skills training and certification so that marginalized people can gain meaningful employment in all types of organizations and industries where digital workforce skills are needed. Libraries have long recognized that they can play an important role in making positive change among marginalized communities as it relates to digital skills.

Community research organizations target multiple ages and express desires to reach out to underrepresented groups. However, administrators interviewed commented that these latter groups are a challenge to attract (i.e., less likely to enroll and difficult to market to).

Public library administrators spoke in broad terms about the democratizing social forces of libraries. There were comparisons of digital literacy in the 21st century to textual literacy in previous centuries, digital inclusion, and the fight against corporate monopolies on information and technology.

Interestingly, community not-for-profit and community research organizations were both very invested in the continuing relevance of public libraries in being able to provide digital skills training to marginalized populations.

All three types of institutions explicitly stressed the need to bridge the digital divide. The following excerpts provide supporting evidence:

- *“It is important for private and corporate organizations to know that it is in their best interests that the digital divide is bridged. For example, take into consideration the current hype in [our city] becoming a “Smart City.” You can’t have a smart city without smart citizens. If you leave people behind [i.e., don’t help them develop their digital literacy skills], then these people won’t live up to their potential, participate in the smart economy, and won’t be able to advance the city’s priorities.”*
- *“In the 21st-century, equitable access to digital information to computers, to Wi-Fi, and how to use it and the support and how to use it is just like learning to read in libraries in 20th-century, it’s required to be competitive in today’s society, it’s like a core democratic value of the reasons why libraries exist.”*
- *“This is more about digital inclusion than digital literacy.”*

Comments made by administrators and instructors speak to the importance of needing to provide digital literacy training to populations that are under-served in society (e.g., @risk youth, seniors, marginalized populations, newcomers to Canada). These interviewees spoke often of the difficulty in reaching these populations, as one administrator noted: *“they are less likely to sign up and attend digital literacy training programs.”*

In terms of ***offering training at convenient times*** to end-users, it is difficult for all three types of organizations identified in this study to provide training at time that is most conducive to local community members. The scheduling of such training depends on instructor availability and attendee availability. It is interesting to consider whether the demographics of people who are already more likely to attend a training session affects the scheduling of such training (i.e., daytime training caters to older adults). As mentioned above, community not-for-profit organizations struggle with attracting youth to attend afterschool programs and attracting underserved populations.

With respect to ***marketing the training***, promoting training classes that are available to the public is difficult. According to instructors interviewed in this study, this is in part due to a limited advertising budget. One instructor spoke about the need to expand advertising efforts:

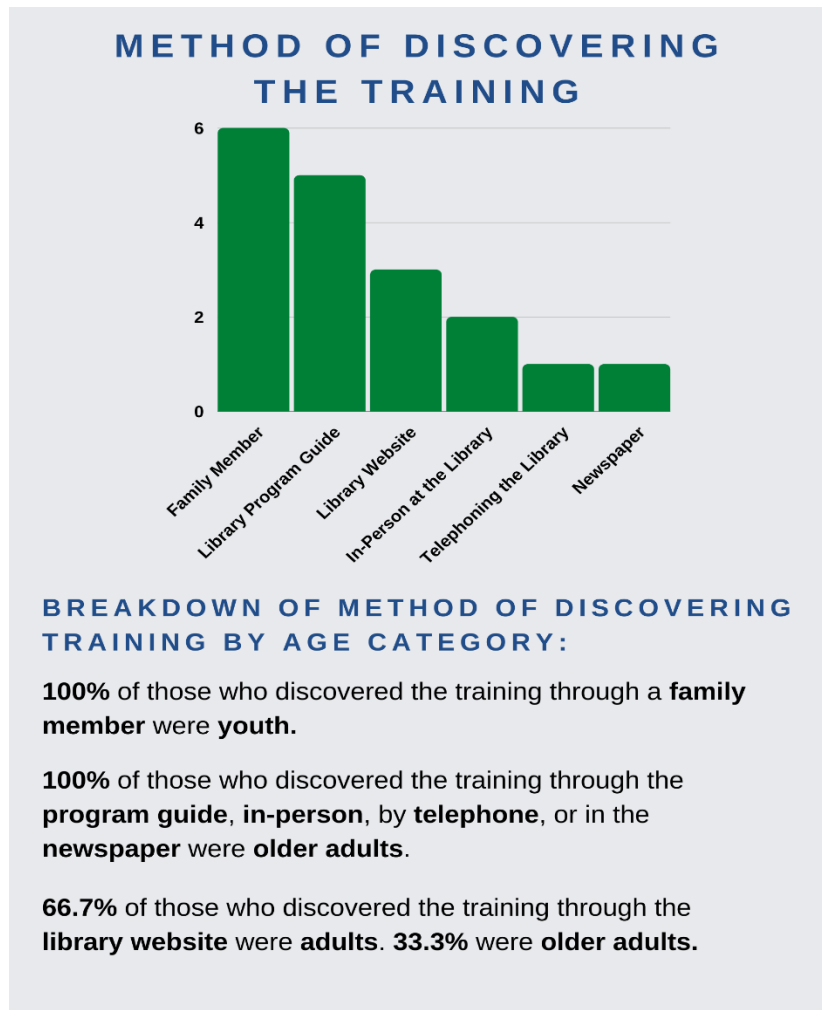
- *“We never really promote ourselves very well. So, a lot of customers will come up and really be blown away with the technology that we have. And then they’ll tell us, we didn’t even know that this place existed.”*

Largely, training is marketed in two main ways in public libraries: i) the library website’s online events system; and, ii) the library’s “What’s Happening” guide. Other techniques, such as social media, are utilized to a small degree, but largely not used in any substantial way for training promotion. Outreach at specific locations, posters, and local media (like the local newspaper) are used to lesser degrees.

Of the 23 end-users interviewed in this study, the two most common methods of discovering the training that they took were through a family member and the library program guide, followed by the library website. In-person at the library, telephoning the library, and seeing an ad in the local newspaper were additional methods, but these were only mentioned by one or two participants. Older adults largely found out about training because of the library program guide, adults through the library website, and youth through a family member.

Community research organizations reported that they market their programs through handouts, posters, branch websites, program guides, employment websites, Youth Hubs, and “Pop up events” set up through Coursera. It seems that programs offered by community research organizations are better able to develop their agendas thorough curriculum design, rather than before actual training begins. This has two benefits: (1) the curriculum can be “shopped out” to potential funders; (2) it can be made into “mini modules: for instructors to implement into their own courses.

It's interesting to consider whether the demographics of people already more likely to come to the training affect the method of discovery (e.g., daytime training caters to older adults who are generally more likely to find out through a print medium like the program guide) or if the library's ways of marketing the training contribute to the demographics of people who come to the training (e.g., the library focuses more on the program guide and its distribution than on social media promotion of trainings, thus reaching mainly older adults), or both. One library administrator noted, it is difficult to ascertain how best to advertise the training the library provides.



Community not-for-profit organizations involved in this study utilized a novel way of reaching out to the community about their digital skills training programs in that they provided live demonstrations about this training to their target audience during times when they can speak to them:

- *“We demo our projects, we let students try it out, we do some live coding. So, okay sure, they can't stay after school and they can't have these other commitments or that they're not interested in having that kind of thing going on. But can we go in during school time where they're already settled in a classroom and all we're doing is kind of delivering that message and getting them engaged a little bit.”*

Community not-for-profit organizations also utilize different approaches to advertise to their target base:

- *“We use social media a lot for promoting youth programs. We work with community partners like schools, city housing for the seniors too. So, partnering with different people in the community that have access to these populations other than us. So, schools are great [to reach out to] kids and youth.”*

Community research organizations commented that one of their key challenges was marketing to populations who were unlikely to use the training. They commented on the importance of needing to provide digital literacy training to populations that are under-served in society, but having much difficulty in reaching target segments as they were less likely to sign up and attend digital literacy training programs.

Regarding ***sharing and adopting best practices***, instructors interviewed in this study commented that although development of digital skills training instruction is planned, it is administered largely through trial and error in terms of figuring out what works, what content to teach, timing, etc. As one participant said: *“We’re willing to kind of fail as we try things.”*

This context is understandable due to the changing nature of technology and community needs, especially with respect to public libraries. Historically, digital skills training emerged in public libraries by offering access to public computers and responding to a need to provide support and literacy skills in this area. But today, the variety of technology a library provides to its members has grown exponentially, causing the need to provide training on a much larger and more complex suite of information technology tools. Makerspaces tend to be an origin point for training in libraries, as libraries find themselves needing to provide training on any piece of technology or software a makerspace provides (e.g., an embroidery machine, as well as Photoshop or Word). This presents a challenge, as the training scope is broad. Keeping up with such community training demands is difficult, leaving even less time and capacity for instructors to reflect upon what elements of the training went well, what did not, sharing these insights with others, and learning from other libraries about their own instructional experiences.

Good efforts are being made by the public libraries involved in this study to address this concern. For example, one of the public libraries involved in this study implemented a digital literacy skills committee, which has working groups within it. These working groups maintain, update, and develop literacy skills courses once a need is identified by clients/staff.

Despite these good efforts, more efforts are needed for public libraries to share their experiences on how best to deliver digital skills training. Currently, knowledge sharing among public library practitioners is heavily based through word-of-mouth and other ad-hoc sharing opportunities, as evidenced by the following interview extracts:

- *“Outside of [my library], the following are used to share best practices: list-servs for various library-related professional associations, personal networks with other librarians in different libraries. Librarians are great at sharing information and ideas with others. It’s a collegial profession... librarians share.”*
- *“Lessons learned about how best to deliver digital literacy training is ad hoc and not well communicated nor well-documented. Often shared by word of mouth.”*

Although professional library associations try to share insights and best practices through digital channels and publications, the up-take and sharing of such information on these channels has been historically low and slow to disseminate. Academic researchers with interests in digital skills training tend to publish their findings in academic outlets, and library practitioners often do not have access to these publications and need more immediate, practical recommendations.

Currently, several difficulties exist in the sharing and uptake of best practice information and leading research in the delivery of digital skills training by public libraries. This includes a lack of time by library practitioners to seek out and read this information, a lack of opportunity for one-stop shopping of such information, and the difficulty in sharing insights and lessons learned by both library practitioners and academic researchers in online and off-line formats, especially on-demand. A better way is needed to share insights and best practices in the delivery of digital skills training among library practitioners and academic researchers.

Challenges include: i) a lack of human resources to share digital skills training knowledge; and ii) a digital collaboration space that secures sufficient uptake.

In terms of **collecting and analyzing performance measurement data**, there is a great lack of activity in this area. Instructors reported they often subjectively measure the success of the training through their own perception of how the training went, but no clear or sufficient performance measurements are actually collected. As one instructor reported:

- *“A lot of it [feedback on the success of the training] is anecdotal in terms of people running the programs are making an assessment based on who’s there, this worked, this didn’t work [...] rather than a hard look at data.”*

In terms of existing performance measurement, one instructor discussed unofficial benchmarking with other library systems, as well as HR keeping track of staff attending the internal training. Some surveys were handed out to the public after classes (only one participant mentioned this, so it may differ branch to branch).

According to instructors, the following categories are important to track for performance measurement:

- Participants’ understanding of the importance of information technology in their lives;
- The degree to which the digital skills training serves under-represented groups or marginalized populations;
- The number/retention of participants in the digital skills training provided.

Further, instructors defined success or referred to positive outcomes in both quantifiable/evaluative terms and less measurable, more subjective terms. Overall, the positive outcomes mentioned most often by instructors involved connection, supervision, or interaction with training participants:

- Positive life outcomes of participants as a result of the training;
- Pedagogical success factors, such as the degree to which the training allows participants to teach themselves, be on the cutting edge of new technology, recognize the importance of being digitally literate, as well as the autonomy of instructors to plan and deliver their classes in ways they see best.

Quantifiable measures of instructor success include:

- Attendance tracking for individual classes;
- Retention as success (same participants returning for courses, seeing participants again using resources on their own).

Subjective or anecdotal measures mentioned by instructors as measures of success (both specific and general) include:

- Informal evaluations through the working group (more of a debrief);
- The library being open and accessible to all, having low barriers, offering people access to information;
- Witnessing increased comfort, confidence, or empowerment with participants' digital literacy skills;
- Staying relevant to clients' needs;
- Connecting with the community;
- Flexibility for staff to figure out best practices for their own classes;
- Teaching people to teach themselves;
- Being on the cutting edge of new technology;
- Appreciation from participants.

As mentioned above, although there are many ways that individual instructors subjectively measure the success of the courses, there is no real feedback system from participants and there is limited formal evaluation. One instructor spoke about this as a challenge to balance evaluation and privacy, referencing the library's ability to give clients the ability to come into the library and use resources anonymously:

- *"There is evaluation, but one of the main tenets of the library is privacy as well."*

Several instructors mentioned the need to capture not only end-user metrics, but instructor metrics too on how well a particular digital skills training session went. Instructors commented on the need to capture both quantitative and qualitative metrics across the board, and the need to compare differences

internally within a single library (branch by branch) or across libraries (within the province). Many instructors discussed the importance to anonymize this data and then open up this data to others for scrutiny and investigation.

Public libraries in this study were heavily concerned with participation numbers and numbers of retention. Analysis of the interview data from administrator and instructors indicate that public libraries worry about these numbers as these numbers reflect the degree to which public libraries are considered as first-point contact points for digital technology information instruction for the communities they serve, and the ability of public libraries to deliver such training on a continual basis.

Regarding the *effectiveness of digital skills training* as experienced by the 23 end-users who were interviewed in this study, almost all participants expressed increased confidence post-training.

Recall that a survey was administered to the 23 end-users who participated in the study. Analysis of the data suggests that the more competence an end-user self-perceives, the less perceived difficulty a person will experience using information technology. In terms of gender, men reported higher competence than women ($p < 0.05$, Mann-Whitney U Test). Men also reported having lower difficulty, but this result was not significant due to the very small sample size in this study. See below.

	Gender	Sample Size	Mean	Std. Deviation
Competence	Men	15	5.15	1.153
	Women	8	3.78	1.456
Difficulty	Men	15	3.20	1.071
	Women	8	4.29	1.740

End-users self-assessed their competence and difficulty using new technology on a 7-point Likert scale (see Appendix D)

Spearman's correlations yielded the following results between age and competence ($-0.37, p < 0.1$) and difficulty ($0.62, p < 0.005$). This can be interpreted as follows: the older people are, the less competence they express, and the more difficulty they have dealing with information technology.

These statistical findings from analysis of the surveys are supported by the analysis of the qualitative data collected. For the qualitative data analysis, three age categories were identified: youth (under 18 years of age; $n=7$); adult (between 18 and 54 years of age; $n=3$); and older adult (55 years of age and older; $n=13$).

Fourteen out of the 16 adult and older adult learners stated during their interviews that the skills learned in their digital literacy training would improve their personal life. Nine of those 16 stated that the training would improve their access to services such as finding a doctor, nutritionist, or authoritative health-related information. Examining the data for differences along gender (men vs. women) and level of difficulty of the instruction (i.e., advanced vs. basic) yielded no significant findings. Instead, for this category, there was consensus that the training offers improvement to one's personal life. Examples participants gave included:

"I like recipes so that's one of the places I'll be searching for a lot. I like that type of thing. [...] So I'm looking up, I'm very much into nature and animals and things like that. So those are the kinds of things I'll use it for."

"Personal enjoyment, personal expansion of knowledge."

"I would want to not lose all that childhood for my kids, childhood memories that I took on the VHS. The stuff they did, I want to preserve that for them."

Closer examination of the data identified that those participants who needed to learn basic digital skills found that learning these skills during the training sessions would improve their access to services, while participants who already had these basic skills before the training felt the training had little effect on providing improved access to such services. Differences between gender along this dimension were

POSITIVE ASPECTS OF TRAINING IDENTIFIED BY PARTICIPANTS

“

IT'S PERFECT. EVERYONE SHOULD REALLY TAKE IT IF THEY'RE TRYING TO GET A JOB IN THE OFFICE BECAUSE EVERYTHING THAT HE TAUGHT WAS USEFUL.

PRINTING THE PICTURE BECAUSE WE GOT TO SEE THE FINISHED PRODUCT.

THEY WERE THERE TO HELP ME AND IT WAS VERY SIMPLE.

BECAUSE IT STARTS WITH THE BASICS.

THE STEP BY STEP ORGANIZATION OF THE TOPIC. THE ILLUSTRATIONS ON THE SCREEN. THE PRACTICAL USE OF DOING IT YOURSELF ON THE COMPUTER. I FIND THE HANDOUTS VERY GOOD.

THE SIZE OF CLASS WAS NICE, THEY'RE INTIMATE. I FIND YOU GET A LOT MORE ONE-ON-ONE LIKE THAT.

I FIND THE INFORMATION IS VERY GOOD. IT'S WELL-PREPARED.

TO USE MY IMAGINATION AND TO CREATE WHAT I LIKE. I LOVE ARTS AND CRAFTS SO USING MY IMAGINATION.

”

found. When the data were normalized, 70% of participants who anticipated improved access to services from the skills learned were women, while 30% were men. Adults and older adults were equal in their response to this question; however, there was a significant difference when examining this category by level of training as those who attended a basic training session (e.g., “Intro to the World Wide Web”; “How to Search with Google”; “Microsoft Word Basics”) felt the training received would improve their access to services in the future, but those who attended an advanced training session (e.g., “Digitize Your Memories”) did not. It seems plausible that participants who needed to learn basic digital skills would find that learning these skills improved their access to services, while participants who already had these basic skills, and were looking to use these skills for a creative purpose or end goal, would perceive themselves as already having the digital literacy necessary to access services and that the training did not provide much value here.

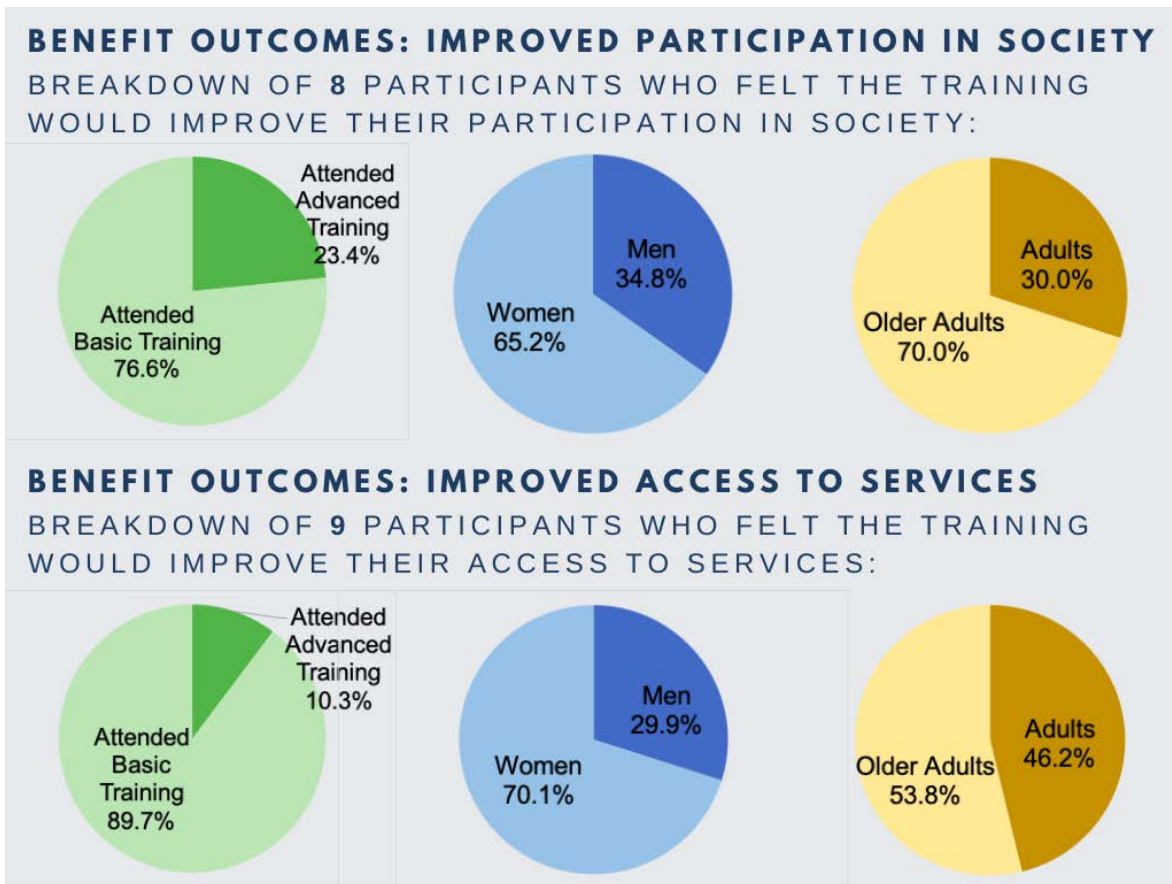
Eight of the 16 adult and older adult learners stated the training would improve their participation in society. Of these, eight community members (participants who attended basic training, participants who were women, and older adult participants) were all more likely to state improvement to participation in society. The following interview excerpt illustrates this point:

“Well, everything's on a computer anymore. I've resisted as much as I can, but you can't. So I have to -- I've had to break down my license fee. The only way to pay it is to do it online, and some more and more things you have to do online. We just went traveling. We went to Europe, and I couldn't get into a museum because I didn't buy the tickets online before I went. So even though I tried, museum kept kicking me out and wouldn't let the tickets process, so I couldn't actually go to that museum while I was there, because if I hadn't bought the tickets online, you can't do anything anymore.”

Several benefit outcomes of taking the training were identified by the 16 adult and older-adult end-user participants:

- Fourteen of these participants expressed Improvement to Personal Life through the skills learned in the training session.
- Nine of these participants stated that these skills would offer Improved Access to Services.
- Half of these participants stated that the skills would allow for Improved Participation in Society.

- Three of these participants (all from the “Digitize Your Memories” training session) stated that the skills they learned would help them with Preservation of Materials.



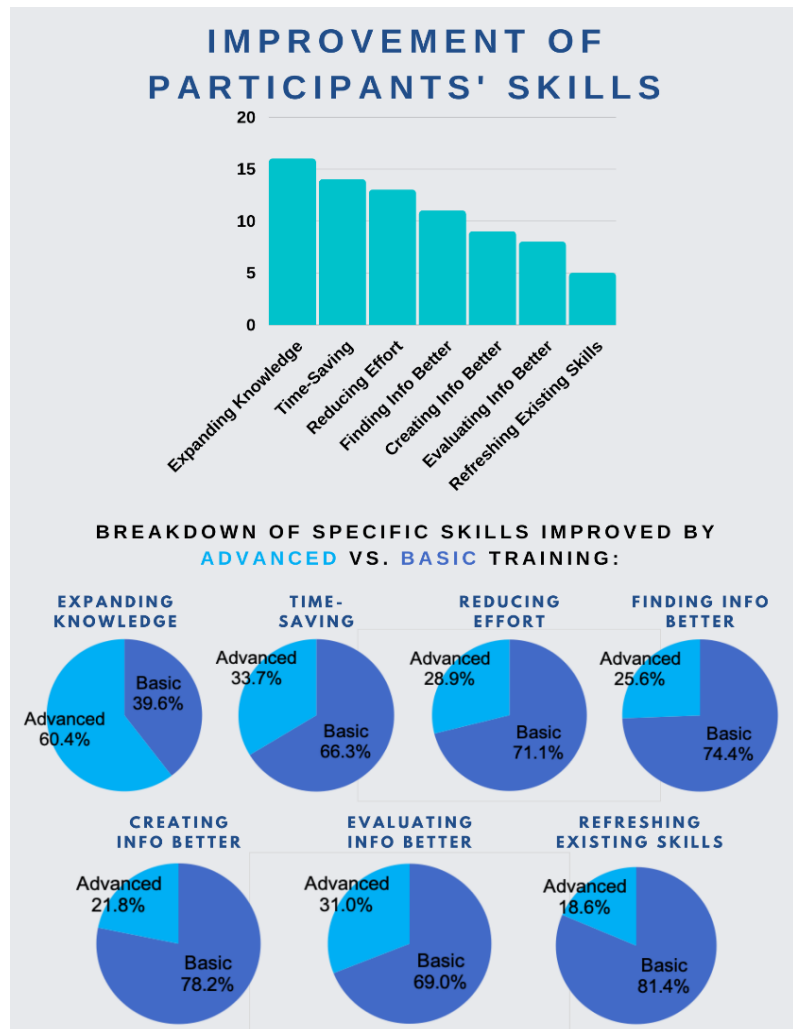
The following are the factors of the training provided as identified as being positive by these 16 participants:

- Learning by doing, experiential learning
- Having a finished product
- Free course
- Step by step process with handouts
- Creative aspects
- Learning the skills
- Instructor’s help

- Starting with the basics
- Focusing on one skill at a time
- Pace of the course
- Useful skills to learn
- Small class size

Eight of the 23 end-users (all men) stated that the skills learned would benefit them in terms of career/employment/education. Note that in reporting this finding, only three participants specifically came to this training for work-related goals; two were adults and one was an older adult. Out of the other five participants, four were youth who stated that the skills would help them in school or a possible future job, and one was a soon-to-be retired older adult who stated that the skills would help if he found a job at a hardware store to stay busy in retirement. Though most of the 23 end-user participants did not attend the training sessions for career development or

education, a significant portion found that the skills provided by the training would be useful for careers/school regardless. An interview excerpt from a youth participant exemplifies this finding when asked how the training would help him in the future: *“Because it helps like me memorize things like the colors of the blocks. It helped me memorize. And it will make it easier for tests to memorize different strategies all of it.”*



4. Discussion

Overall, the findings reported above present a complex picture of digital skills training provided by public libraries, community not-for-profit organizations, and community research organizations. All organizations recognize and acknowledge the importance of providing digital skills training to local community members, especially those from marginalized populations.

Local community members, especially older adults, who attended these training sessions report that improved access to services and improved participation in society occurred as a result of the training received. Almost all participants felt that the training received would improve their personal life in some way, and a significant percentage felt the skills they learned would likely benefit them in terms of career/education/employment.

Basic training instruction resulted in greater improvement of skills overall. Participants who attended basic training sessions were consistently more likely to report improvement in creating new information, evaluating new information, finding new information, reduction of effort, reinforcing/refreshing existing skills, and achieving time-savings. Participants who attended advanced training were more likely to report expanding their knowledge/skill with technology.

Public libraries were found to be leaders in community digital literacy skills training. They provide a critical access point to the public, particularly with marginalized populations. However, administrators worry that libraries are not considered contact points for knowledge about digital technology (i.e., a user might rather contact a computer store or helpline). There are concerns amongst administrators that public libraries are not considered key contact points for digital technology information for local community members.

Common barriers or challenges mitigate the delivery of digital skills training amongst all three types of organizations. For example, there is a need for further staff training, specific performance evaluations, better marketing of digital skills training courses, and more varied scheduling of digital skills training classes (in part to allow for additional demographics to hear about, be interested in, and attend the training).

The data collected and analyzed suggest the need to reach marginalized populations is even more paramount due to the COVID-19 pandemic. COVID-19 has produced unprecedented, record-breaking

unemployment in Canada. Marginalized communities have disproportionately suffered losses in employment and face significant challenges gaining re-employment due to a lack of digital skills. Those most likely to secure new employment are those who are digitally competent and literate. The general public can obtain the digital skills needed for re-employment through free public library-based training.

Results suggest that the provision of such training will help those affected by COVID-19 to more fully participate in today's digital world. The training will help them obtain gainful employment, improve job performance, gain access to government services and high-quality health information online, and maintain social connections with others. Public libraries are especially primed to offer help in this area. Not only do they have expertise in delivering digital skills training to people from all walks of life, they are also well situated in the local communities they serve to reach and provide free digital skills training to the people who need it the most.

Overall, the findings presented above describe four categories of success in the delivery of digital skills training by local community organizations:

- Improvement of community members' general understanding of the role and importance of information technology in their daily lives.
- Increased digital skills development of community members, especially among under-represented groups (i.e., marginalized populations).
- Evidence of positive life outcomes (e.g., increased confidence; application of skills learned to new jobs/education, hobbies) from people who take the training.
- Healthy statistics in the number of people who take digital skills training courses and become recurring participants in future training sessions offered by the organization.

Recall, the purpose of this study was to answer two research questions:

- i. "What factors affect the success of digital literacy training led by local community organizations?" and, given these factors,
- ii. "How can local community organizations best deliver the digital literacy initiatives they provide to the communities they serve?"

In terms of these research questions, the following factors and recommendations were identified:

- Organize and train staff. This would involve providing better training opportunities for staff so that they can be more up-to-date on the technical aspects of the training they provide, and be better prepared to allocate time to devote to training during their working day.
- Acquire sustainable funding. This would require examination of new and sustainable funding models for the training provided across all three types of organizations investigated in this study.
- Reach marginalized populations. This includes better mechanisms to advertise training opportunities to marginalized populations, as well as better ways to secure their continued participation in such training.
- Offer training at convenient times to end-users. All local community organizations need to reflect on how to offer training at times that are most conducive to their target audiences.
- Better market the training. Current marketing methods are lacking and basically secure attention from those who traditionally visit a public library.
- Share and adopt best practices. Better knowledge sharing is needed amongst those who deliver digital literacy training to local community members. Technological solutions are needed to enhance knowledge sharing, as well as opportunities for face-to-face in-person sharing.
- Better collect and analyze performance measurement data. This area has the greatest potential for improvement. Minimal performance measurement data is currently being collected. There is room to collect more extensive and richer quantitative and qualitative metrics.

Next steps in this project involve the communication of this working paper to administrators/instructors involved in this study to refine/verify the findings of the study, as well as to partner organizations. This is a form of member-check.

From there, a theoretical model and sample survey instruments will be developed by the research team. These will be vetted by partner organizations involved in the study and modified based on the feedback received to yield one or more finalized survey instruments.

Next steps from there involve the administration of survey instruments to public library administrators across Canada and clients who receive training offered by public libraries across the nation. The goal is to not only gain a national picture of digital literacy initiatives offered by public libraries, but to better understand how organizational and end-user considerations surrounding these initiatives impact digital literacy training success. Partner organizations on the project (i.e., the Canadian Urban Libraries Council and the Canadian Federation of Libraries Association) will help rally participation among public libraries and their local community members

Once done, a theoretical model of the factors affecting the delivery of digital literacy instruction by local community organizations will be developed and recommendations for practice will be produced. The goal will be to better understand how organizational and end-user considerations surrounding local community organization digital skills training initiatives impact digital literacy training success amongst the communities they serve. From there, both academic and practitioner publications will be produced.

5. Conclusion

This working paper outlines results from an exploratory investigation of the factors affecting the success of digital literacy training initiatives run by local community organizations, including public libraries. The goal was to not only identify a preliminary set of factors, but also to leverage insight from these factors to produce recommendations for practice about how to run successful digital literacy training events for local community organizations. There is little, if any, scholarly work on the success of digital literacy initiatives run by local community organizations. Recommendations for practice are needed for local community organizations, such as public libraries, wishing to deliver successful digital literacy training to members of their communities.

6. References

- Bawden, D. (2001). Information and digital literacies: A review of concepts. *Journal of Documentation*, 57(2), 218-259.
- Charmaz, K. (2014). *Constructing grounded theory* [2nd ed.]. Los Angeles: Sage.
- Cole, B. & Ryan, P. (2016). Public Libraries. In *Being Evidence Based in Library and Information Practice*. Koufogiannakis, D. & Brett, A. (Eds.). London, UK: Facet Publishing.
- Detlor, B., Julien, H., Willson, R., Serenko, A., & Lavalley, M. (2011). Learning outcomes of information literacy instruction at business schools. *Journal of the Association for Information Science and Technology*, 62(3), 572-585.
- Detlor, B. (2018). Invited speaker. *Promoting digital literacy in the community: A social lab approach*, May 4, Institute for Informatics and Digital Innovation, Edinburgh Napier University, Edinburgh, Scotland.
- Engestrom, Y. (1987). *Learning by expanding: An activity-theoretical approach to developmental research*, Orienta-Konsultit.
- Gilster, P. (1997). *Digital Literacy*. Wiley, New York.
- Glaser, B. G. (1978). *Theoretical sensitivity: Advances in the methodology of grounded theory*. Sociology Press.
- Glaser, B. G. (1998). *Doing grounded theory. Issues and discussions*. Sociology Press.
- Glaser, B. G., & Strauss, A. L. (1967). *The discovery of grounded theory: Strategies for qualitative research*. Aldine Publishing Company.
- Hadziristic, T. (2018). *The State of Digital Literacy in Canada: A Literature Review*. White Paper (April 10), Toronto: Brookfield Institute for Innovation + Entrepreneurship. Available at <https://brookfieldinstitute.ca/report/the-state-of-digital-literacy-a-literature-review/>. Last accessed June 2, 2020.
- Horrigan, J. B. (2015). Libraries at the Crossroads. Report (September 15). Washington, DC: Pew Research Center. Available at <http://www.pewinternet.org/2015/09/15/libraries-at-the-crossroads/>. Last accessed June 2, 2020.
- ICTC (2016). *Digital talent road to 2020 and beyond: A national strategy to develop Canada's talent in a global digital economy*. Available at https://www.ictc-ctic.ca/wp-content/uploads/2016/03/ICTC_DigitalTalent2020_ENGLISH_FINAL_March2016.pdf. Last accessed June 2, 2020.
- Innovation, Science and Economic Development Canada (2019a). *Government of Canada investing in teaching digital skills to Canadians who need them most*. News Release, May 21. Available at <https://www.canada.ca/en/innovation-science-economic-development/news/2019/05/government-of->

[canada-investing-in-teaching-digital-skills-to-canadians-who-need-them-most0.html](#). Last accessed June 2, 2020.

Innovation, Science and Economic Development Canada (2019b). *Digital literacy exchange program*. November 22. Available at http://www.ic.gc.ca/eic/site/102.nsf/eng/h_00000.html. Last accessed June 2, 2020.

Julien, H. (2018). Digital literacy in theory and practice. In *Encyclopedia of information science and technology*, 4th Ed., (2243-2252). Khosrow-Pour, M. (Ed.). IGI Global.

Julien, H., & Breu, R. (2005). Instructional practices in Canadian public libraries. *Library & Information Science Research*, 27(3), 281-301.

Julien, H., & Hoffman, C. (2008). Information literacy training in Canada's public libraries. *Library Quarterly*, 78(1), 19-41. One of LQ's top 20 most accessed articles.

Leont'ev, A. N. (1981). *Problems of the development of the mind*. Progress Publishers.

Miles, M.B., Huberman, A.M., & Saldana, J. (2014). *Qualitative Data Analysis: A Methods Sourcebook*. Sage, Thousand Oaks, CA.

Nordicity (2018). *Technology access in public libraries: Outcomes and impacts for Ontario communities*. Available at <https://www.torontopubliclibrary.ca/content/bridge/pdfs/nordicity-full-report.pdf>. Last accessed, June 2, 2020.

Public Library Association (2020). *Digital literacy*. Available at <http://www.ala.org/pla/initiatives/digitalliteracy> . Last accessed June 2, 2020.

Serenko, A., Detlor, B., Julien, H., & Booker, L. (2012). A model of student learning outcomes of information literacy instruction in a business school. *Journal of the American Society for Information Science and Technology*, 63(4), 671–686.

Takala, P. (2018). Confidential briefing to the Canadian Federation of Library Associations (CFLA) Board from the Chair of the Canadian Urban Libraries Council, March 27th.

Vygotsky, L. (1978). *Mind in society: The development of higher psychological processes*. Harvard University Press.

Appendix A – Interview Questions - Administrators

The following are the questions asked of administrators during their one-on-one interview sessions.

- 1) What kinds of digital literacy (skills) training programs does your organization provide?
- 2) Why does your organization provide this training?
 - Is it part of your organization's mandate or mission/vision statement or strategic plan?
 - Does your organization's mission/vision statement or strategic plan mention digital literacy? To what extent?
 - Where can I find a copy of your organization's mission/vision statement or strategic plan?
- 3) How does your organization go about deciding which type of training to offer?
- 4) How does your organization promote (advertise, market) this training to the public?
 - Who is responsible for this activity?
 - Comment on the success of each type of promotion.
 - How do you evaluate the effectiveness of the promotion?
- 5) Identify two or three digital literacy training programs your organization provides that, in your opinion, are the most important/significant or the most popular among your constituents.

For each of these digital literacy training programs, ask the following questions:

5a) Purpose

What is the purpose of providing this specific type of training?

- Why is your organization interested in this type of training?
- What does your organization hope to gain from offering this type of training?

5b) History

How did this type of training emerge (come to be)?

- What is the history of this training? Describe how the delivery of this type of training came to be?
- When/how long ago was this training first established?
- How has this training emerged/changed over the years?

5c) Impact on the Organization

How has the delivery of this type of training impacted your organization?

- How has your organization reacted to the delivery of this training?
- Are people in the organization pleased? Worried? Concerned? Explain.
- How has this training affected your staff on a personal level
 - In terms of their daily role
 - Job motivation?
 - Job satisfaction?
 - Organizational loyalty?
 - Intrinsic motivation?

What do you envision the future impact of the delivery of this type of training will be on your organization?

5d) Impact on the Public

How has the public reacted to the delivery of this type of training?

What do you see as the outcomes of this training in terms of digital literacy skills and/or changes in attitudes towards digital literacy among those who participate in the training?

- Psychological outcomes?
- Behavioral outcomes?
- Benefit outcomes?

What do you envision the future impact of this type of training will be on the public (your constituents)?

5f) Set up and delivery of this type of training

If another local community organization or public library called you up and asked you for advice on what are things one needs to do, or have in place, to deliver this type of training... what would you tell them?

- What worked well?
- What aspects of the training were especially useful (e.g., specific topic elements, timing, instructional method, pedagogic techniques)?
- What things could be improved and/or things that someone should be aware of in order to prevent a poorly designed/implemented training program from happening?
 - Are there ways in which the training might be improved?

6) Other Things to Ask:

6a) In your opinion, what constitutes a successful digital literacy training program?

- What are the key characteristics of a training opportunity that make it good (effective)?

6b) What are the main challenges of teaching digital literacy skills to the public?

6c) Are there any official or commonly-accepted guidelines you use to design and deliver your digital literacy training programs?

6d) Do you benchmark your training programs? Explain.

- What performance measurements do you collect?
- How do you utilize these performance measures?
 - Reporting? Re-design of the training?

6e) Comment on the governance structure / project management approach used in design and implementation of the digital literacy training programs your organization provides.

- What works well?
- What needs improvement?
- What challenges exist? How can they be overcome?
- What unique challenges exist for a training initiative involving multiple partner organizations... are there special tensions (e.g., different objectives among the partners) that need to be considered?

7) Last Question:

- Is there anything I have forgotten to ask or comments you want to include that we haven't covered yet in this interview?

Appendix B – Interview Questions – End-Users

The following are the questions asked of people who attended a digital literacy training session during their one-on-one interview sessions.

The Learning Environment

- 1) How did you learn or find out about the training you just took part in?
- 2) Why did you decide to take part in this training?
- 3) How do you typically keep your digital skills up-to-date?
 - Take courses such as this? Self-learn?

Program Components

- 4) What aspects of the training did you like the best? Why?
 - What worked well?
 - Content?
 - Demand in the marketplace for the skills taught?
- 5) What aspects of the training did you like the least? Why?
 - What needs improvement? What challenges exist? How could they be overcome?

Psychological Outcomes

- 6) To what extent did the instruction affect your confidence and/or level of anxiety with the content taught specifically, or toward digital technology in general?

Behavioural Outcomes

- 7) What is the likelihood that you will apply / utilize the skills taught in the course in the future?
- 8) To what extent, because of the training that you received, do you feel that you can perform those skills more efficiently or effectively than before the training?
 - Time-savings?
 - Reduction in effort?
 - Finding better information sources?
 - Finding more information sources?
 - Finding more relevant information sources?

Benefit Outcomes

- 9) What are the benefits of the training you received?
 - Will it influence your career development or employment in any way?
 - Will it influence the degree to which you can participate in society more?
 - Will it allow you to access more services than before (e.g., government, medical)?
 - Will it affect your personal life in any way? Explain.

Last Question:

- 10) Is there anything I have forgotten to ask or comments you want to include that we haven't covered yet in this interview?

Appendix C – Interview Questions - Instructors

The following are the questions asked of instructors during their one-on-one interview sessions.

1) What kinds of digital literacy (skills) training programs do you provide/teach?

For each digital literacy training program the person teaches, ask the following questions:

- 2) Why does your organization provide this training?
 - Is it part of your organization's mandate or mission/vision statement or strategic plan?
 - Does your organization's mission/vision statement or strategic plan mention digital literacy? To what extent?
 - Where can I find a copy of your organization's mission/vision statement or strategic plan?
 - What is the purpose of providing this specific type of training?
- 3) Who takes this training?
 - Comment on the general demographics of the people who take your course.
 - Do these people possess a sufficient digital literacy skill set? Explain.
 - If it is too low, what can be done to improve it?
 - Describe the digital literacy skills participants already possess.
- 4) In regards to the training program you teach, what specific digital literacy skills are taught?
 - Are participants required to have or use any specific DL skills? If yes, elaborate.
- 5) How does your organization promote (advertise, market) this training to the public?
 - Who is responsible for this activity?
 - Comment on the success of each type of promotion.
 - How do you evaluate the effectiveness of the promotion?
- 6) History
How did this type of training emerge (come to be)?
 - What is the history of this training? Describe how the delivery of this type of training came to be?
 - When/how long ago was this training first established?
 - How has this training emerged/changed over the years?
- 7) Impact on the organization
How has the delivery of this type of training impacted your organization?
 - How has your organization reacted to the delivery of this training?
 - Are people in the organization pleased? Worried? Concerned? Explain.
 - How has this training affected staff
 - In terms of their daily role
 - Job motivation?
 - Job satisfaction?
 - Organizational loyalty?
 - Intrinsic motivation?

What do you envision the future impact of the delivery of this type of training will be on your organization?

8) Impact on your personal job

How has the delivery of this type of training impacted your role or job in the organization?

- Are people in the organization pleased? Worried? Concerned? Explain.
- How has this training affected your
 - o Job motivation?
 - o Job satisfaction?
 - o Organizational loyalty?
 - o Intrinsic motivation?

What do you envision the future impact of the delivery of this type of training will be on your job or role in the organization?

9) Impact on the public

How has the public reacted to the delivery of this type of training?

What do you see as the outcomes of this training in terms of digital literacy skills and/or changes in attitudes towards digital literacy among those who participate in the training?

- Psychological outcomes?
- Behavioral outcomes?
- Benefit outcomes?

What do you envision the future impact of this type of training will be on the public (your constituents)?

10) Set up and delivery of this type of training

If another local community organization or public library called you up and asked you for advice on what are things one needs to do, or have in place, to deliver this type of training... what would you tell them?

- What worked well?
- What aspects of the training were especially useful (e.g., specific topic elements, timing, instructional method, pedagogic techniques)?
- What things could be improved and/or things that someone should be aware of in order to prevent a poorly designed/implemented training program from happening?
 - o Are there ways in which the training might be improved?

11) Other things to ask:

In your opinion, what constitutes a successful digital literacy training program?

- What are the key characteristics of a training opportunity that make it good (effective)?

What are the main challenges of teaching digital literacy skills to the public?

Are there any official or commonly-accepted guidelines you use to design and deliver your digital literacy training program?

Do you benchmark your training program? Explain.

- What performance measurements do you collect?

- How do you utilize these performance measures?
 - Reporting? Re-design of the training?

Comment on the governance structure / project management approach used in design and implementation of the digital literacy training program.

- What works well?
- What needs improvement?
- What challenges exist? How can they be overcome?
- What unique challenges exist for a training initiative involving multiple partner organizations... are there special tensions (e.g., different objectives among the partners) that need to be considered?

12) Last question:

- Is there anything I have forgotten to ask or comments you want to include that we haven't covered yet in this interview?

Appendix D – Demographic Questionnaire

This questionnaire was administered to end-users who participated in a digital literacy training session.

1. Age? _____
2. Gender? _____
3. Are you a newcomer to Canada (within the last 5 years)?
 - Yes
 - No
 - Prefer not to answer
4. What is your highest level of education?
 - Currently a pre-High School student
 - Currently a student in High School
 - High School diploma
 - College diploma
 - Undergraduate degree
 - Graduate degree
 - Other
 - Prefer not to answer

5. How do you rate your **level of competency** using information technologies?

Extremely Weak				Average				Excellent	
1	2	3	4	5	6	7			Prefer Not To Say

6. How do you rate your capability of using information technologies to **find** information?

Extremely Weak				Average				Excellent	
1	2	3	4	5	6	7			Prefer Not To Say

7. How do you rate your capability of using information technologies to **create** information?

Extremely Weak				Average				Excellent	
1	2	3	4	5	6	7			Prefer Not To Say

8. How do you rate your capability of using information technologies to **evaluate** information?

Extremely Weak				Average				Excellent	
1	2	3	4	5	6	7			Prefer Not To Say

9. How **comfortable/confident** are you at learning and using a new information technology?

Not at all Comfortable/Confident			Moderately		Extremely Comfortable/Confident		Prefer Not To Say
1	2	3	4	5	6	7	

10. Indicate your agreement/disagreement with the statements below:

- ☐ I often have difficulties when trying to learn how to use a new information technology

Strongly Disagree			Neutral		Strongly Agree		Prefer Not To Say
1	2	3	4	5	6	7	

- ☐ I find working with a new information technology confusing

Strongly Disagree			Neutral		Strongly Agree		Prefer Not To Say
1	2	3	4	5	6	7	

- ☐ I always seem to have problems when trying to use a new information technology

Strongly Disagree			Neutral		Strongly Agree		Prefer Not To Say
1	2	3	4	5	6	7	

- ☐ I enjoy working with a new information technology

Strongly Disagree			Neutral		Strongly Agree		Prefer Not To Say
1	2	3	4	5	6	7	

- ☐ I usually find it easy to learn how to use a new information technology

Strongly Disagree			Neutral		Strongly Agree		Prefer Not To Say
1	2	3	4	5	6	7	

- ☐ I seem to waste a lot of time struggling with a new information technology.

Strongly Disagree			Neutral		Strongly Agree		Prefer Not To Say
1	2	3	4	5	6	7	

Appendix E – Initial Code Book - Administrators

These codes reflect training offered by an organization IN GENERAL, and with SPECIFIC training programs. These codes are based on the interview questions asked of administrators.

The Learning Environment

- Types of Digital Literacy Training Offered (*the general types of digital literacy training opportunities provided by an organization*)
- Reasons for Offering Training (*motivation behind why an organization offers digital literacy training in general*)
- Part of Organization's Mission or Strategic Plan
- Factors Impacting the Decision to Offer Which Type of Training
- Target Audience for Training (*the types of people an organization targets to receive digital literacy training in general*)
- Marketing the Training (*how an organization or instructor advertises digital literacy training opportunities to the public in general*)
- Performance Measurement of the Training (*how training is evaluated in general*)
- Design of the Training (*the pedagogy behind the training provided; how changes to the training take shape over time*)
- Governance (*how the training is managed across the organization*)
- Reasons for Taking the Training (*motivation behind why a local community member takes digital literacy training*)

Program Components of a Training Session

- Digital Literacy Skills Taught (*the type of digital literacy skills taught in a specific training session*)
- Reasons for Offering Training (*motivation behind why an organization offers a specific digital literacy training*)
- History of the Training (*how a specific training first started and has changed over time*)
- Impact of the Training on the Organization
- Positive Aspects of the Training (*features of the training that work well or are appreciated by local community members*)
- Negative Aspects of the Training (*features of the training that need improvement or are not appreciated by local community members*)

Psychological Outcomes of Local Community Members

- Positive Effects (*positive changes in local community member attitudes as a result of taking a specific training session*)
 - Increased Confidence Using New Information Technology
 - Decreased Difficulty Using New Information Technology
 - Increased Interest or Desire to Learn about New Information Technology
- Negative Effects (*negative changes in local community member attitudes as a result of taking a specific training session*)
 - Decreased Confidence Using New Information Technology
 - Increased Difficulty Using New Information Technology
 - Decreased Interest or Desire to Learn about New Information Technology

Behavioural Outcomes of Local Community Members

- Likelihood of Utilizing the Skills Taught (*the degree to which a person will use the skills learned in the training session in the future*)
- Improvement of Skills (*the extent to which a person feels he/she can perform the skills taught more efficiently or effectively than before the training*)
 - Time-savings
 - Reduction in effort
 - Finding information better
 - Creating information better
 - Evaluating information better

Benefit Outcomes of Local Community Members

- Career Development or Employment
- Improved Participation in Society
- Improved Access To Services (e.g., government services, medical services)
- Improvement to Personal Life

Appendix F – Initial Code Book – Instructors and End-Users

These codes reflect a SPECIFIC digital literacy training program or session. These codes are based on the interview questions asked of instructors and local community members.

The Learning Environment

- Digital Literacy Training Offered (*the specific type of digital literacy training provided by an instructor*)
- Reasons for Offering Training (*motivation behind why an organization or instructor offers this specific digital literacy training*)
- Part of Organization's Mission or Strategic Plan
- Target Audience for Training (*the types of people an organization or instructor targets to receive a specific digital literacy training*)
- Marketing the Training (*how an organization or instructor advertises the digital literacy training to the public*)
- Discovering the Training (*how a local community member learns or finds out about a specific digital literacy training opportunity*)
- Impact of the Training on the Organization
- Impact of the Training on the Instructor Who Provides the Training
- Reasons for Taking the Training (*motivation behind why a local community member takes digital literacy training*)
- Methods for Keeping Digital Skills Up-To-Date (*ways in which a local community member keeps his/her digital skills current*)
 - Takes courses
 - Self-learns

Program Components of a Training Session

- Digital Literacy Skills Taught (*the type of digital literacy skills taught in a specific training session*)
- History of the Training (*how the training first started and has changed over time*)
- Performance Measurement of the Training (*how the training is evaluated*)
- Design of the Training (*the pedagogy behind the training; how changes to the training take shape over time*)
- Governance (*how the training is managed across the organization*)
- Positive Aspects of the Training (*features of the training that work well or are appreciated by local community members*)
- Negative Aspects of the Training (*features of the training that need improvement or are not appreciated by local community members*)

Psychological Outcomes of Local Community Members

- Positive Effects (*positive changes in local community member attitudes as a result of taking a specific training session*)
 - Increased Confidence Using New Information Technology
 - Decreased Difficulty Using New Information Technology
 - Increased Interest or Desire to Learn about New Information Technology
- Negative Effects (*negative changes in local community member attitudes as a result of taking a specific training session*)

- Decreased Confidence Using New Information Technology
- Increased Difficulty Using New Information Technology
- Decreased Interest or Desire to Learn about New Information Technology

Behavioural Outcomes of Local Community Members

- Likelihood of Utilizing the Skills Taught (*the degree to which a person will use the skills learned in the training session in the future*)
- Improvement of Skills (*the extent to which a person feels he/she can perform the skills taught more efficiently or effectively than before the training*)
 - Time-savings
 - Reduction in effort
 - Finding information better
 - Creating information better
 - Evaluating information better

Benefit Outcomes of Local Community Members

- Career Development or Employment
- Improved Participation in Society
- Improved Access To Services (e.g., government services, medical services)
- Improvement to Personal Life