LEARNERGAINS

RESEARCH PROJECT
FINAL REPORT

Prepared for the Ministry of Advanced Education and Skills Development
by the College Sector Committee for Adult Upgrading

Bea Clark

Sandra Hennessey

Michael Herzog

CSC COLLEGE SECTOR COMMITTEE *for* ADULT UPGRADING

DECEMBER 2016

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Executive summary

Since 2012, the Ministry of Advanced Education and Skills Development (MAESD) has supported enhancements and pilot projects of two online Essential Skills assessment tools developed by the CSC: Essential Skills for Ontario's Tradespeople (ESOT) and Essential Skills for Employment and Education (ESEE). Both tools are used by public and private sector organizations.

The Learner Gains Research Project was developed to provide feedback and information about the ESEE tool. LBS learners at 45 pilot sites took one, two or all three of the Essential Skills for Employment and Education (ESEE) assessments, measuring reading, document use and numeracy skills.

The CSC, with the cooperation of the LBS service providers involved, conducted the administration of this project as per the agreement with MAESD.

The CSC provided online and telephone support for the duration of the project, January – November 2016. **Overall, the ESEE assessment platform worked well and very few technical difficulties were encountered.**

Based on feedback from the LBS service providers on the assessment tool, support services and user experience, recommendations to improve the tool and the client experience are included in this report.

In excess of 2,800 individuals registered for the assessment and, of this group, 2,782 completed one or more of the assessments for a total of 6,563 assessments. Tests taken include 5,537 entry or pre-tests and 1,026 exit or post-tests during the period of the pilot project.

Approximately 19% of the learners completed an exit or post-test and the results demonstrated positive skill gain across all sectors.

There are a number of factors that likely affected the number of completed post-tests including test fatigue among learners, the time required to take the test, no incentive or requirement for learners to complete the post-test and the relatively short duration of the pilot within the context of an LBS learner's goal plan.

It is important to note that during the project, there were publicly posted critiques and efforts to discredit the project, the curriculum framework established by Employment Ontario and the Ministry itself for undertaking this pilot project. The Executive Committee of the CSC expressed its concern regarding these actions and the Executive Director conveyed these concerns to MAESD representatives. The CSC did not comment publicly on this matter.

Overall, the CSC is satisfied that this pilot has confirmed the findings from previous, smaller ESEE pilots. This pilot produced a new and fairly large sample of post-test data to examine. As from previous projects and pilots, the learning has led to further identification of improvements and enhancements to be considered.

MAESD conducted an independent survey of the service providers involved in this pilot and the results of this survey should also inform future improvements. A survey of the learners involved in this pilot was not undertaken and MAESD should consider this for future pilots.

The CSC welcomes the opportunity to discuss the results of this pilot with MAESD staff. If the Ministry is considering expanded usage of the ESEE assessment tool, the CSC recommends consideration of the recommendations in this report, methods of administering the assessment, other tools used by LBS service providers and methods of motivating LBS learners.

Background — Learner gains project

The Ministry of Advanced Education and Skills Development (MAESD) is responsible for Ontario's employment and training network, which includes the delivery of the Literacy and Basic Skills (LBS) program. LBS is delivered by a network of service providers in communities across Ontario. The Ontario Literacy and Basic Skills (LBS) program helps adults in Ontario to develop and apply communication, numeracy, interpersonal and digital skills to achieve their goals. The LBS program serves clients who have goals to successfully transition to employment, postsecondary, apprenticeship, secondary school, and increased independence. The program includes clients who may have a range of barriers to learning.

In the fall of 2015, MAESD expressed an interest in using the Essential Skills for Employment and Education (ESEE) tool as a gateway to understanding clients' experiences and progress through the LBS program. MAESD subsequently contracted with the College Sector Committee for Adult Upgrading (CSC) to support the administration of the ESEE assessment to approximately 1800 new LBS clients at 45 LBS service provider sites representing all LBS streams (Anglophone, Francophone, Aboriginal, and Deaf). During the Learner Gains Research Project, the CSC provided access to ESEE, registration, training and support to pilot sites from January to November 30, 2016.

Background — the development of ESEE & ESOT

The College Sector Committee for Adult Upgrading (CSC) is the support organization representing academic upgrading and LBS programs and staff in Ontario's 24 public community colleges. The CSC provides professional resources, information, reports, expertise and research to its members. In addition, the CSC is an LBS e-channel deliverer of ACE Distance, an online program which prepares adult clients for entry into college programs, apprenticeship or employment.

In 2010 and 2011, the CSC developed two online applications: Essential Skills for Ontario's Tradespeople (ESOT); and Essential Skills for Employment and Education (ESEE) in partnership with the Essential Skills Group, a leader in online essential skills assessments and learning solutions. Both applications were created to assess and build an individual's Essential Skills in reading, document use and numeracy – foundation skills upon which other skills are built.

ESOT specifically allows individuals to research Essential Skills for 53 Red Seal trades, take online assessments to see how their skills measure up (there are assessments for each trade) and build their skills with customized learning plans using free online materials.

ESOT is currently being used in an MAESD pilot project seeking to support apprentices in the Central region.

Initially ESEE, or ACE ES as it was originally called, was developed in response to needs identified by ACE Distance staff who deliver the online Academic and Career Entrance (ACE) program. By late 2011, ESEE was used by ACE Distance and all Anglophone colleges.

At the request of the Ministry and the two Francophone colleges, a funding request was submitted to the Ministry to translate both ESEE and ESOT into French.

The translation project was funded and completed in 2012, thereby providing college LBS clients with access to ESEE and ESOT in their preferred language.

An additional project allowed the CSC to further enhance ESEE by developing and embedding ASL videos for deaf and hard of hearing learners.

The ESEE tool features:

- Assessments that compare the reading, document use, numeracy skills of test takers to general academic and vocational requirements;

- More than 140 embedded American Sign Language (ASL) videos to support deaf and hard-of-hearing learners; and

- Learning plans that provide over 400 English and French learning activities.

ESEE is believed to be the only online essential skills assessment tool with ASL support.

In 2013, based on interest in ESEE expressed by other LBS service providers, the CSC offered the opportunity to register and use the tool (at no charge) to all interested LBS programs via an announcement distributed through sector and stream organizations. New registrations were closed in April 2015 due to budget considerations.

The ESEE fact sheet is available on the CSC's website.

An e-commerce option was added to ESEE in 2016, attracting employer interest and use, although it has not yet been marketed.

Chronology — MAESD / CSC projects involving ESEE & ESOT

APRIL 2012
Ministry requests ACE ES and ESOT demonstration
- French translation and name change discussed.

JUNE – DECEMBER 2012
ESEE/ESOT French translation project
- Both online assessment tools were translated with input and support from both Francophone colleges, Collège Boréal and La Cité.
- Both tools were piloted, feedback was obtained and incorporated.

OCTOBER 2013 – MARCH 2014
ESEE/ESOT pilot project
- Both assessment tools were piloted by school board and community based literacy organizations in Anglophone, Francophone and Aboriginal streams.
- Revisions, additions and improvements were made to the tools based on pilot feedback. Recommendations resulted in a follow-up pilot.

2013 – 2014
Preparing Online Learner Gains Assessment Tools / ESEE ASL Adaptation
- An ASL adaptation of ESEE was developed, as well as a user guide. ASL videos were incorporated.

JUNE 2014 – MARCH 2015
ESEE - Supporting Learner Gains Assessment Implementation project
- This project focused on 3 different areas:

  - a locator pre-test process to automatically stream clients to the assessment version best suited to their abilities or provide documentation of exemption;

  - a Level 1 assessment specifically designed for low-skilled clients; and

  - a very accurate Level 1, 2 and 3 assessment that has more challenging questions for more advanced clients.

- Feedback resulted in several additions and improvements incorporated both during and post-project.

JANUARY – DECEMBER 2016
Learner Gains Research Project
- The current Learner Gains Research project is the fifth project funded and/or conducted by the Ministry.
- As in previous projects, service providers involved in the pilots were cooperative, even though they may have had reservations about the Ministry's intentions, the assessment tool, the process or the outcomes.

| SUMMARY | GENERAL INFO | **METHODOLOGY** | KEY FINDINGS | RESULTS/ ANALYSIS | RECOMMENDATIONS |

Methodology — roles and responsibilities

MAESD

MAESD provided information and direction about the project to participating pilot sites via the Employment Ontario Partners' Gateway (EOPG) which included:

- **an introductory memo** on December 21, 2015: *Learner Gains Research Project to Launch in January* http://www.tcu.gov.on.ca/eng/eopg/publications/lbs_memo_learner_gains.pdf

- **a December 21, 2015 Q & A document**: *Service Provider Questions and Answers* http://www.tcu.gov.on.ca/eng/eopg/publications/lbs_sp_learner_gains_qanda.pdf

- **an updated March 1, 2016 Q & A posting** http://www.tcu.gov.on.ca/eng/eopg/publications/lbs_learner_gains_qs_and_as.html

- di**rections for inputting ESEE scores to EOIS-CaMs** posted March 14, 2016 http://www.tcu.gov.on.ca/eng/eopg/publications/memo_cams_entering_esee.html

- **an amended LBS contract** for participating service providers

- **an early June email from program ETCs** to service providers providing the sites target and actual assessment numbers based on EOIS CaMS input

- **a memo on November 4, 2016** reminding pilot sites about final entry dates for exit assessment scores http://www.tcu.gov.on.ca/eng/eopg/programs/lbs_updates.html

CSC

The CSC's Project Manager provided participating service providers with:

- **Confirmation of participation** in the LGR pilot

  Confirmations with instructions were emailed January 17/18, 2016 to the participating service provider list provided by the Ministry. There was some initial confusion and delay as these contacts were organizational signing authorities (e.g., Directors of Education, Vice-Presidents, Executive Directors, etc.) rather than front line LBS program operations staff.

  Smaller organizations were able to direct the information to the appropriate staff and request registration revisions to start the assessment process immediately. Larger organizations were contacted by the Project Manager if they had not registered test administrators within 2 weeks.

  COFA was contracted to translate the introductory communications, translate and deliver the e-channel training webinar and provide initial support to the 7 Francophone program participants.

- **Access to ESEE**

  ESEE registrations were activated once the initial email was sent and the site administrator was identified. The organization username and password were provided directly following the initial email.

  By mid-March 2016, all pilot sites except two had assigned test administrators and administered pre-tests to clients. One organization withdrew from the pilot and one was still reviewing staffing requirements to participate.

SUMMARY	GENERAL INFO	METHODOLOGY	KEY FINDINGS	RESULTS/ ANALYSIS	RECOMMENDATIONS

Methodology — roles and responsibilities

CSC (continued)

The CSC's Project Manager provided participating service providers with:

- **Instructions and User Guides for ESEE**

  All pilot sites were provided with ESEE registration, information, user guides and personal support.

- **ESEE training and e-channel webinar**

  All site contacts were registered to participate in e-channel ESEE training on January 20, 2016. The session was recorded and made available so that those who were unable to attend, or additional program staff, could view the webinar.

- **Email and telephone support during the project**

  The Project Manager provided ongoing telephone and/or email support to all pilot sites for the duration of the project.

- **Raw assessment data**

  Raw data was compiled and reported to MAESD at the end of each month. Pre-test data was accepted from January 2016 until June 30th, at which time the interim report was prepared. Phase 2 consisted of post-testing clients as they completed their LBS program. Several program participants continued to pre- and post-test resulting in an increase of 787 clients completing one or more assessments. This increased the post-test sample size by approximately 10%.

- **Interim Report**

  Data was analyzed and the resulting reports were provided to MAESD in an interim report on June 30, 2016. At the request of MAESD, additional information was provided in July in an addendum to the interim report.

- **Final Report December 23, 2016**

| SUMMARY | GENERAL INFO | METHODOLOGY | KEY FINDINGS | RESULTS/ ANALYSIS | RECOMMENDATIONS |

Data-related information and processes

Assessments are delivered in a two-step process, beginning with a six-question locator mini-test. The web application uses the results of the locator mini-test to stream clients into three pathways.

- **Exemption: Very low skilled** learners who do not answer more than two of the six questions correctly are exempted from the Type A/Type B assessment
- **Type A: Low skilled** learners who received the Type A (Level 1) assessment based on the six-question locator
- **Type B: Moderately low to highly skilled** learners who were directed to the Type B assessment (Level 1, 2, 3 assessment) based on the six-question locator

How did we categorize the relative strength of correlations?

VALUE OF R	STRENGTH OF RELATIONSHIP
-1.0 to -0.5 or 1.0 to 0.5	Strong
-0.5 to -0.3 or 0.3 to 0.5	Moderate
-0.3 to -0.1 or 0.3 to 0.1	Weak
-0.1 to 0.1	None or very weak

Data filtering using time as a proxy for effort

To increase the precision and value of some findings, we used test durations to filter out test scores that likely do not reflect the true skills of test takers. Test durations (the time taken by test takers to complete assessments) is a good proxy for effort. The following table presents the test duration cut-off times used to filter out specific assessments. These cut-off times filter out test instances where clients complete assessments approximately >60 per cent more quickly than average.

SKILL	TEST DURATIONS FILTERED OUT
Reading	
15-item Type A	<8 minutes
30-item Type B	<13 minutes
Document use	
15-item Type A	<8 minutes
30-item Type B	<13 minutes
Numeracy	
20-item Type A	<10 minutes
40-item Type B	<16 minutes

Test data was filtered as required. Unfiltered data is labeled (unfiltered). Filtered data is labeled (filtered).

Data filtering techniques used for pre- and post-test analysis

To ensure that comparisons between pre- and post-test scores are based on similar parameters, we only considered data from clients who took the same type of assessment, either Type A or Type B, on both their pre- and post-test.

To reduce the influence of test results that likely do not reflect the actual abilities of clients, we:

- did not include results from test instances where clients took too little time to complete either their pre-test or post-test;
- converted negative skill gain scores to zero (0). For example, where a client scored 220 on a pre-test and 210 on their post-test, we increased their post-test score by 10 points to match their pre-test score. It is unlikely that clients lose skills in a time frame of nine months or less, in light of their participation in training.

Data-related information and processes (cont'd)

Statistical reliability of findings

We use data collected from pre- and post-tests to report on the performance of clients using variables such as location and their sector/stream. For example, we compare the skill gains achieved by clients registered by colleges to those registered by school boards.

The reliability of our findings is greatly influenced by sample size, which in our case is the number of test instances included in the calculation. Results that are reliable are accurate, reproducible, and consistent from one testing occasion to another. That is, if the testing process were repeated with a group of test takers, essentially the same results would be obtained.

Generally, larger sample sizes produce more reliable results.

The framework in the chart below is used to classify the reliability of results.

SAMPLE SIZE (N)	NOTES
<15 NR	Results reported using sample sizes of 14 or fewer are not reliable and should not be used to make inferences. We do not include this data in our analysis. **Results based on sample sizes of less than 15 are indicated using** NR
15-29 MR	Results reported using sample sizes of 15-29 may not be reliable. We include data points with sample sizes of 15-29 in our analysis, but extreme caution should be exercised when making inferences involving this data. **Results based on sample sizes of 15-29 are indicated using** MR
30 + RR	Results reported using sample sizes of 30 or greater can be considered relatively reliable. This data can be used to make inference, but we recommend exercising caution if the sample sizes are in lower range. RR

Data-related information and processes (cont'd)

How do we label the significance of skill gains measured using pre- and post-test scores?

SKILL GAIN INCREASE	DESCRIPTOR
0 - 5 points	Not significant
6 - 20 points	Significant
>20 points	Very significant

Limitations

Impact of effort on the accuracy of test scores - Like other competency-based assessments, ESEE can most accurately score test takers who use their best efforts to correctly answer questions. There is no way to determine whether individual test takers used their best effort to answer questions.

Measurements of effort using time as a proxy – The time needed by test takers to complete assessments is used as a proxy for best effort. The assumption is that test takers who rush through questions are using less effort to answer questions correctly compared to those who spend more time. While the differences in the scores of filtered and non-filtered test results suggests the assumption is sound, there likely are test takers who can very quickly complete assessments using their best effort. It is also likely that some client who took longer to answer questions did not use their time effectively.

Inaccuracy of test duration times - Our test duration measurement system starts when clients begin their assessment and ends when their assessment is completed. As clients can complete assessments in multiple sittings, test duration statistics do not necessarily reflect the actual time test takers needed to complete any one assessment.

Inconsistent test invigilation practices – While all test takers receive the same instructions after logging in, differences in test invigilation practices may impact the outcome of test scores. Some organizations closely monitor clients during on-site testing sessions while others allow clients to complete assessments off-site such as at home.

SUMMARY	GENERAL INFO	METHODOLOGY	KEY FINDINGS	RESULTS/ ANALYSIS	RECOMMENDATIONS

Key findings

Programming results in skill gains

Notwithstanding the issues discussed in the report and highlighted in this section, there were measurable skill gain achievements:

Average Skill Gains

- Skill gains achieved by clients streamed toward the Type A assessment designed for lower skilled was 21 (MR) points. Only skill gains results from reading are usable due to small sample sizes.

- Skill gains achieved by clients streamed toward the Type B assessment designed for higher skilled was 16 points, ranging from gains as high of 21 in numeracy and as low as 11 in reading.

Skill gains achieved within specific sectors / streams

While clients from all sectors and streams demonstrated skill gains, Aboriginal clients gained the most, an average of 37 (MR) points per skill.

Average skills gains by sector/stream

TYPE B	+/ DIFF
Aboriginal	37 (MR)
Anglophone school board	20 (MR)
Anglophone college	14 (RR)
Francophone community-based	13* (MR)
Anglophone community-based	12 (RR)
Deaf	N/A
Francophone college	N/A

Skill gains achieved by region

While clients from all regions demonstrated skill gains, Northern clients gained the most, an average of 30 points per skill. The other three regions had skill gains ranging from an average of 12 to 15 points per skill.

TYPE B	+/ DIFF
North	30 (RR)
Central	15 (RR)
East	13 (RR)
West	12 (RR)

Key findings

General skill levels of clients

A very small percentage of clients do not have the skills needed to complete an online assessment.

- One per cent of clients were exempted from taking the reading assessment
- One per cent of clients were exempted from taking the document use assessment
- Two per cent of clients were exempted from taking the numeracy assessment

A small percentage of clients demonstrate very weak essential skills.

- 17 per cent of clients were directed to the Type A reading assessment
- 13 per cent of clients were directed to the Type A   document use assessment
- 14 per cent of clients were directed to the Type A numeracy assessment

Most clients have the skills needed to handle the more challenging Type B assessment.

- 82 per cent of clients were directed to the Type B reading assessment
- 86 per cent of clients were directed to the Type B document use assessment
- 83 per cent of clients were directed to the Type B numeracy assessment

The web application's streaming system effectively directs clients to the appropriate type of assessment:

Reading

- Clients streamed to the reading assessment designed for those with lower skills (Type A), had an average score of 192.
- Clients streamed to the reading assessment designed for those with higher skill (Type B), had an average score of 240.

Document Use

- Clients streamed to the document use assessment designed for those with lower skills (Type A), had an average score of 173.
- Clients streamed to the document use assessment designed for those with higher skill (Type B), had an average score of 231.

Numeracy

- Clients streamed to the numeracy assessment designed for those with lower skills (Type A), had an average score of 149.
- Clients streamed to the numeracy assessment designed for those with higher skill (Type B), had an average score of 234.

| SUMMARY | GENERAL INFO | METHODOLOGY | KEY FINDINGS | RESULTS/ ANALYSIS | RECOMMENDATIONS |

Key findings

There are factors that impacted the amount and quality of data collected

1. Effort put forth by test takers

Results from over 1,000 tests were not used because clients did not invest enough time (effort) in their test to provide an accurate measure of their skill.

2. Low rates of post-testing

On average, only 19 per cent of clients took a pre- and post test. This resulted in small sample sizes and hampered our ability to more thoroughly investigate the skill gains achieved by sub populations such as sectors and streams.

3. The ability for clients to complete the tests in multiple sittings hindered our ability to accurately measure test durations and may have negatively affected test scores. More than 10 per cent of clients took extended breaks during their testing experience, a process that likely reduced their overall scores.

4. The Type B numeracy assessment may have too many questions.

Currently, Type B reading and document use assessments have 30 questions and the Type B numeracy assessment has 40 questions. As highlighted in Table E2, only 63 per cent of clients taking the Type B numeracy assessment completed the test in one hour, compared to rates of over 80 per cent for the other Type B assessments. Excessively long assessments create issues like cognitive load and testing fatigue that often result in lower scores.

The testing experience was practically glitch-free

Clients completed more than 6500 assessments, answering approximately 167,000 questions (not including those on the locators). Of the 43 error reports attributed to project clients, only six were the result of glitches. Thus the percentage of reported glitches per completed assessment is approximately **0.0001%**.

SUMMARY	GENERAL INFO	METHODOLOGY	KEY FINDINGS	RESULTS/ ANALYSIS	RECOMMENDATIONS

Results and analysis

A) Number of clients who participated in the project

Of the 2,863 clients registered, 2,782 completed one or more assessments. These 2,782 clients completed a total of 6,563 assessments to November 30, 2016:

Table A – Unfiltered assessments by skills and test

SKILL	# OF ASSESSMENTS (N)		% OF TOTAL COMPLETING POST TESTS (UNFILTERED)
	PRE TESTS ONLY (UNFILTERED)	POST TESTS (UNFILTERED)	
Reading	2,629	449	17%
Document use	1,163	247	21%
Numeracy	1,745	330	19%
6,563 Total assessments	5,537	1,026	19%

Analysis: The project resulted in a large sampling of pre-test data that included over 5,500 test instances. Although not as large a sample, the post-test data set is also significant with a total sample of over 1,000 test instances.

- Reading was the most frequently selected assessment, followed by numeracy and then document use.
- Only a small proportion (<22 %) of clients took both pre- and post-tests.
- The percentage of post-tests completed for each skill was relatively consistent, with a range of 4 percentage points (17 – 21).

B) Total number of test instances filtered out by assessment type

The following tables present data on test instances that were filtered out where test takers spent insufficient time on the test to produce results that likely reflect their true skills.

- **Table B1** presents the total number of test instances filtered out due to test durations that were too short.

- **Table B2** presents the total number of test instances filtered out because test takers took less time on their post-tests indicated in table C.

Table B1 - number of pre-tests filtered because they did not meet minimum test durations

SKILL	TOTAL # OF PRE TESTS (excluding exempted clients)	# OF FILTERED PRE TESTS	% OF TOTAL
Reading	2,603	400	15%
Document Use	1,150	244	21%
Numeracy	1,714	175	10%
Total	**5,467**	**819**	**15%**

Table B2 - number of post-tests filtered because they did not meet minimum test durations

SKILL	TOTAL # OF POST TESTS (excluding exempted clients)	# OF FILTERED POST TESTS	% OF TOTAL
Reading	445	83	19%
Document Use	243	63	26%
Numeracy	325	49	15%
Total	**1,013**	**195**	**19%**

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SUMMARY	GENERAL INFO	METHODOLOGY	KEY FINDINGS	RESULTS/ ANALYSIS	RECOMMENDATIONS

C) Average scores using filtered and non-filtered results

The following tables compare averaged test scores of filtered and non-filtered test instances.

Table C1 - average scores of filtered and non-filtered pre-tests

SKILL	AVERAGE SCORE OF NON FILTERED TEST RESULTS	AVERAGE SCORE OF FILTERED TEST RESULTS	+/
Reading	231	236	+5
Document use	224	232	+8
Numeracy	219	226	+7

Table C2 - average scores of filtered and non-filtered post-tests

SKILL	AVERAGE SCORE OF NON FILTERED TEST RESULTS	AVERAGE SCORE OF FILTERED TEST RESULTS	+/
Reading	229	235	+7
Document use	229	233	+4
Numeracy	234	246	+12

Analysis: The differences in test scores between filtered and non-filtered test instances suggests that those who meet the minimum time thresholds perform better than those who do not.

- On average, test takers score 7 points higher on Type A assessments when they meet the minimum time thresholds.

- On average, test takers score 8 points higher on Type B assessments when they meet the minimum time thresholds.

SUMMARY	GENERAL INFO	METHODOLOGY	KEY FINDINGS	RESULTS/ANALYSIS	RECOMMENDATIONS

D) Comparison of test durations between pre- and post-tests

The following table presents the average test durations of clients who took the same type of pre- and post-test (i.e. Type A).

Table D - Average test durations of test takers who took the same type of pre- and post-test

SKILL	Average time taken on Type A and B pre tests (mins)	Average time taken on Type A and B post tests (mins)	Time difference (mins)	% difference
Reading	27	22	-5	-20%
Document Use	22	20	-2	-11%
Numeracy	41	34	-7	-17%

Analysis

Our ability to compare pre- and post-test duration times is hindered by our timing system. The timer used to measure test durations starts when clients begin their assessment and ends when their assessment is completed.

As clients are permitted to complete assessments in multiple sittings, test duration statistics do not necessarily reflect the actual time test takers needed to complete any one assessment.

We addressed the issue by using only those test results where a) test takers took the same assessment and b) we were confident that tests were completed in a single sitting.

The differences in time spent on pre- and post-test indicate that test takers do not, on average, spend as much time on their post test compared to their pre-tests.

- Clients spend 11% - 20% less time on their post-test compared to their pre-test.
- There is a strong likelihood that post-test scores would be higher if clients spent a similar amount of time on their post-tests as compared to pre-tests.

SUMMARY	GENERAL INFO	METHODOLOGY	KEY FINDINGS	RESULTS/ ANALYSIS	RECOMMENDATIONS
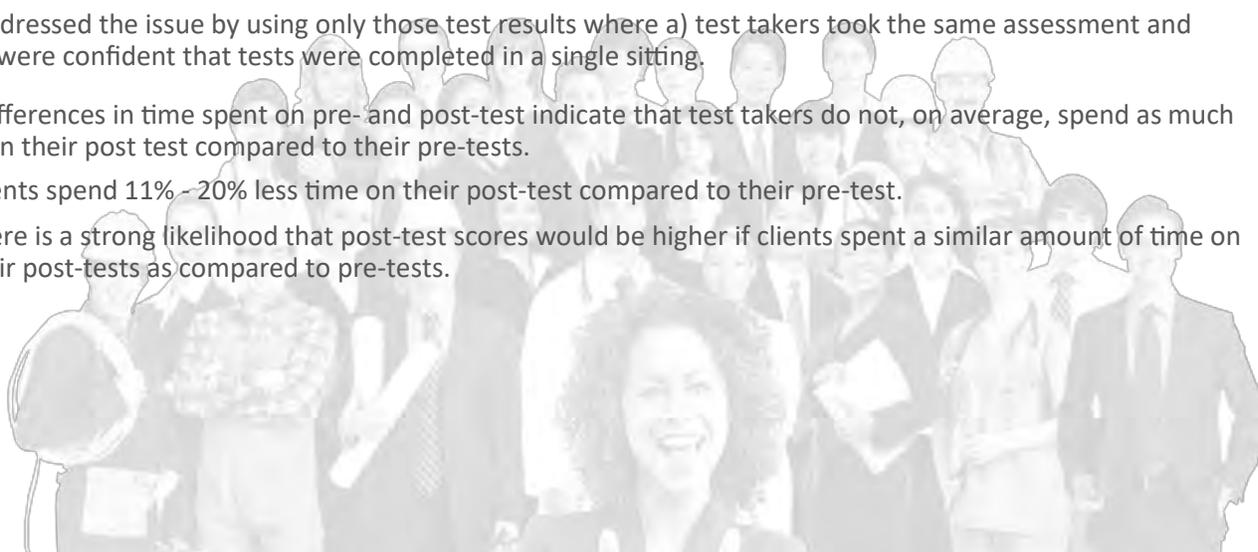
E) Average test durations by skills and type

The following tables present the average test durations by skill and test type.

Table E1 - Average test durations for Type A assessments

SKILL	# of questions	Durations							
		1 30 mins		31 60 mins		61 90 mins		> 90 minutes	
		#	%	#	%	#	%	#	%
Reading Type A	15	398	89%	28	6%	1	0%	15	3%
Document use Type A	15	139	93%	5	3%	1	1%	4	3%
Numeracy Type A	20	215	79%	28	10%	7	3%	21	8%
Totals		752	87%	61	7%	9	1%	40	5%

Table E2 - Average test durations for Type B assessments

SKILL	# of questions	Durations							
		1 30 mins		31 60 mins		61 90 mins		> 90 minutes	
		#	%	#	%	#	%	#	%
Reading Type B	30	1075	50%	783	36%	109	5%	192	9%
Document use Type B	30	675	67%	181	18%	28	3%	117	12%
Numeracy Type B	40	325	23%	572	40%	248	17%	299	21%
Totals		2075	45%	1536	33%	385	8%	608	13%

Analysis: As noted in section D, analysis involving test durations is hindered by our timing system. Notwithstanding these limitations, there are some noteworthy trends:

1. **Completion times for Type A assessments designed for lower skilled clients:**

- 89 per cent of clients completed reading assessments in 30 minutes or less, 93 per cent of clients completed document use assessments in 30 minutes or less, and 79 per cent of clients completed numeracy assessments in 30 minutes or less. On average, clients who took longer than 90 minutes spent 330 hours to complete their assessment. This strongly suggests that these clients did not complete the assessment in a single sitting.

2. **Completion times for the more challenging Type B assessments:**

- 86 per cent of clients completed reading assessments in 60 minutes or less, 85 per cent of clients completed document use assessments in 60 minutes or less, and 63 per cent of clients completed numeracy assessments in 60 minutes or less. The lower completion rate within the one-hour time frame suggests that the numeracy assessment may be too long. On average, clients who took longer than 90 minutes to complete their Type B assessment took 103 hours to complete their assessment. This strongly suggests that these clients did not complete the assessment in a single sitting.

F) Correlations between scores and test durations

The following tables present correlations between filtered and unfiltered scores and test durations.

Table F1 - Correlation between filtered test scores and duration

SKILL	Correlation between filtered test scores and duration	N
Reading	0.18	1,985
Document Use	0.18	751
Numeracy	0.29	1,250

Table F2 - Correlation of unfiltered test scores and duration

SKILL	Correlation between unfiltered test scores and duration	N
Reading	0.31	2,256
Document Use	0.35	995
Numeracy	0.44	1,380

Analysis:

- Filtered scores (Table F1): The correlation to test scores and duration in reading and document use are weak. Numeracy scores have a significantly higher correlation compared to reading and document use but even these correlations are weak (but almost moderate).

- Unfiltered scores (Table F2): The correlations between unfiltered test scores and test durations in all three skill areas are moderate.

- The correlations for unfiltered scores are higher than filtered scores. This suggests that those who rush through assessments score more poorly than those who spend adequate amounts of time.
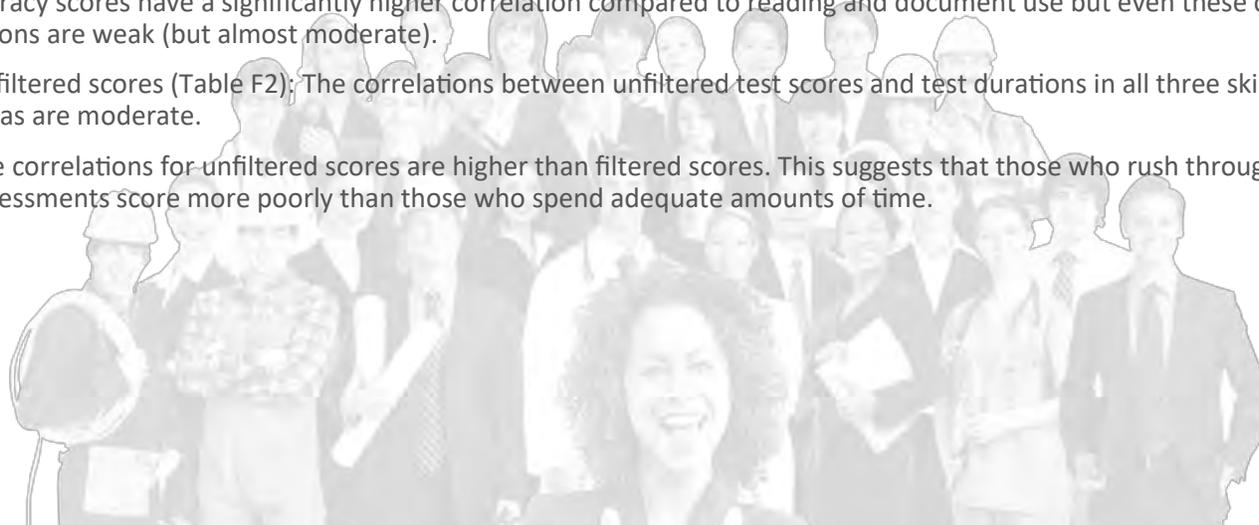
G) Distribution of clients by the 6-item locator

Assessments are delivered in a two-step process beginning with a six-question locator mini-test. The web application uses the results of the locator mini-test to stream clients into three pathways:

Path 1 - Exemption: Clients who do not correctly answer at least two locator questions correctly are exempted from continuing with the longer version assessments.

Path 2 - Type A assessments: These 15-20 question assessments are designed for lower-skilled clients. Clients who correctly answer two, three or four of the six locator questions are streamed into this test.

Path 3 - Type B assessments: These 30-40 question assessments are designed for higher-skilled clients. Clients who correctly answer five or six of the six locator questions are streamed into this test.

The following tables presents data about the distribution of clients based on their performance on the locator:

Table G1 - Distribution of clients who took pre-tests, using unfiltered test scores

Reading	# of assessments taken	%	Average score
# of tests taken	2,629	100%	
# of exempted clients	26	1%	N/A
# of clients assigned Type A	443	17%	192
# of clients assigned Type B	2,160	82%	240

Document Use	# of assessments taken	%	Average score
# of tests taken	1,163	100%	
# of exempted clients	13	1%	N/A
# of clients assigned Type A	149	13%	173
# of clients assigned Type B	1,001	86%	231

Numeracy	# of assessments taken	%	Average score
# of tests taken	1,745	100%	
# of exempted clients	31	2%	N/A
# of clients assigned Type A	271	16%	149
# of clients assigned Type B	1,444	83%	231

G) Distribution of clients by the 6-item locator (cont'd)

Table G2 - Distribution of clients who took **post-tests**, using underlined text scores

Reading	# of assessments taken	%	Average score
# of tests taken	449	100%	
# of exempted clients	4	2%	N/A
# of clients assigned Type A	69	14%	142
# of clients assigned Type B	377	84%	239

Document Use	# of assessments taken	%	Average score
# of tests taken	247	100%	
# of exempted clients	4	2%	N/A
# of clients assigned Type A	29	12%	197
# of clients assigned Type B	213	86%	234

Numeracy	# of assessments taken	%	Average score
# of tests taken	330	100%	
# of exempted clients	5	2%	N/A
# of clients assigned Type A	41	12%	135
# of clients assigned Type B	264	86%	249

Analysis

- Overall, two per cent or fewer clients were exempted. This infers that 98% of clients likely have the skills needed to complete an online assessment.

- Only 15% of clients demonstrated weak enough skills to be streamed into the 15-20 item Type A assessments designed for lower-skilled people.

- Most clients (84%) clients demonstrated strong enough skills to be streamed into the 30-40 item Type B assessments designed for higher-skilled people.

- The six-item locator appears to effectively stream clients to the appropriate type of assessment:

    - Clients streamed to the Type A assessments scored 165, on average; and

    - Clients streamed to the Type B assessments scored 237, on average.

| SUMMARY | GENERAL INFO | METHODOLOGY | KEY FINDINGS | RESULTS/ ANALYSIS | RECOMMENDATIONS |

H) Distribution of clients by age

Clients were asked to complete a short questionnaire the first time they logged in that included a question about their age. There is no way to verify if the information they provided was correct. There are a small number of cases where clients entered nonsensical information, such as birthdates starting in 2016. Obviously incorrect data was not included in the analysis of age ranges.

Table H - Distribution of clients by age

AGE	N	%
Unknown	261	9%
<20	171	6%
20-24	636	22%
25-29	429	15%
30-34	344	12%
35-39	246	9%
40-44	200	7%
45-49	182	6%
50-54	144	5%
55-60	144	5%
>60	105	4%
Totals	2,863	100%

Analysis

- The majority if clients are between the ages of 20-34.

- The number of clients in the 35-39, 40-44, 45-49, 50-54, 55-60, and >60 age groupings is relatively similar.

SUMMARY	GENERAL INFO	METHODOLOGY	KEY FINDINGS	RESULTS/ANALYSIS	RECOMMENDATIONS

I) Distribution of clients by gender and stream

The short questionnaire clients completed also included a question about their gender. There is no way to verify if the information they provided is accurate.

Table I - Distribution of registrants by gender and stream (not all registrants completed assessments)

SECTOR / STREAM	FEMALE	MALE	TOTAL
Aboriginal	37	36	73
Anglophone College	847	700	1547
Anglophone Community-based	234	171	405
Anglophone School Board	350	212	562
Deaf	33	47	80
Francophone Community-based	132	45	177
Francophone College	3	0	3
Sub-total	1636	1211	2847
Registrants who did not disclose gender			16
Total registrants			2,863

Analysis

- 16 registrants did not disclose gender.
- The client population is over represented by females. About 57% of clients are female, 42% male. In 2012, the Ontario population distribution by gender was 51% female, 49% male.
- Francophone Community-based organizations had the highest representation of females (75% female, 25% male).
- Organizations serving the deaf and hard-of-hearing had the highest representation of males (41% female, 59% male).

SUMMARY	GENERAL INFO	METHODOLOGY	KEY FINDINGS	RESULTS/ANALYSIS	RECOMMENDATIONS

J) Correlation of age and score by skill

We compared the self-identified age of clients to their pre-test scores.

Table J - Correlations between age and scores by skill

SKILL	CORRELATION OF AGE AND SCORE
Reading	0.05
Document Use	0.10
Numeracy	0.11

Analysis:

There is a weak correlation between age and score. Older test takers are as likely to score as well as younger test takers.

K) Correlation of skill by location

Table K—comparison of scores by region

REGION	Reading (filtered)		Document use (filtered)		Numeracy (filtered)	
	Score	N	Score	N	Score	N
Central	235	1109	205	111	222	712
East	244	1109	240	353	229	459
North	236	134	239	102	210	218
West	227	400	231	340	204	408

Analysis:

- Eastern region clients demonstrated significantly higher proficiency in all three skills.

- Northern and Western region clients have relatively strong reading and document use skills, but weak numeracy skills.

SUMMARY	GENERAL INFO	METHODOLOGY	KEY FINDINGS	RESULTS/ ANALYSIS	RECOMMENDATIONS

L) Correlation of gender and score by skill

We compared the self-identified gender of clients to their pre-test scores.

Table L - Correlations between gender and scores

SKILL	Pre test female provincial mean score (filtered)	Pre test male provincial mean score (filtered)	Correlation
Reading	237	236	
Document Use	229	237	0.8
Numeracy	221	232	

Analysis: There is a strong correlation between gender and score.

M) Skill by region and stream/sector

Table M—comparison of filtered and averaged pre-test scores by region and stream/sector.

SECTOR/STREAM	Regional Average (filtered)					# of assessments taken (filtered)
	Central	East	North	West	Mean	
Aboriginal			224	210	216 RR	146
Anglophone college	238	250		219	240 RR	2254
Anglophone community-based	203	228	232	221	224 RR	875
Anglophone school board	212	237		228	232 RR	1117
Deaf	177			141	175 RR	132
Francophone college	258				258 NR	5
Francophone community-based	208	226	229	239	223 RR	252
Mean	**216**	**235**	**228**	**210**	**224** RR	**4781**

Analysis: There appears to be a strong relationship between learner scores and their sector/stream.

- Clients from Anglophone colleges (avg. 240) demonstrate the highest skills, marginally higher than clients from Anglophone school boards (avg. 232).
- Clients from Anglophone community-based (224) and Francophone Community-based (223) have similar average scores.
- Clients from deaf organizations demonstrated the weakest skills (avg. 175). Clients from Aboriginal organizations had the second-lowest skills (avg. 216).
- There are significant skill differences by region. Francophone community-based clients in the West scored significantly higher (239) than other Western clients (208). Anglophone community-based clients in the North scored significantly higher (232) than Central clients (203).

SUMMARY	GENERAL INFO	METHODOLOGY	KEY FINDINGS	RESULTS/ ANALYSIS	RECOMMENDATIONS

N) Reading — comparison of pre- and post-test scores by assessment type and stream

The following tables present the scores of clients who completed the same type (i.e. Type A) of reading pre- and post-tests.

Table N1 — comparison of filtered pre- and post-test reading scores by type

RT	Pre	Post	+/ Diff	N
Type A	167	188	21 MR	26
Type B	243	254	11 RR	288

Analysis:

Type A: Clients scored 21 MR points higher on their Type A post-test compared to their Type A pre-test. This is a very significant gain.

Type B: Clients scored 11 points higher on their Type B post-test compared to their Type B pre-test. This is a significant gain.

Table N2 — comparison of filtered pre– and post-test reading scores by stream

TYPE A	Pre	Post	+/ Diff	N
Aboriginal	N/A	N/A	N/A	0
Anglophone college	204	233	29 NR	8
Anglophone community-based	152	179	27 NR	5
Anglophone school board	137	162	26 NR	2
Deaf	175	175	0 NR	5
Francophone college	N/A	N/A	N/A	0
Francophone community-based	174	193	19 NR	6
Type B	**Pre**	**Post**	**+/ Diff**	**N**
Aboriginal	229	259	30 MR	19
Anglophone college	249	258	9 RR	184
Anglophone community-based	242	251	9 RR	37
Anglophone school board	233	244	11 MR	18
Deaf	231	231	0 NR	4
Francophone college	N/A	N/A	N/A	0
Francophone community-based	221	225	11 MR	26

Analysis:

Type A:

Sample sizes are too small to make inferences about skill gain.

Type B:

- Aboriginal clients scored 30 MR points higher on their Type B post-test compared to their Type B pre-test. This is a very significant gain in proficiency.

- Clients from Anglophone colleges, Anglophone community-based organizations, Anglophone school boards and Francophone community-based organizations demonstrated significant skill gains ranging from 9-11 points.

| SUMMARY | GENERAL INFO | METHODOLOGY | KEY FINDINGS | RESULTS/ ANALYSIS | RECOMMENDATIONS |

Table N3— comparison of filtered pre- and post-test reading scores by location

TYPE A	Pre	Post	+/ Diff	N
Central	171	172	1 NR	9
East	175	193	18 NR	6
North	221	221	0 NR	1
West	154	196	42 NR	10
TYPE B	Pre	Post	+/ Diff	N
Central	246	255	8 RR	127
East	252	263	12 RR	71
North	237	257	20 RR	37
West	229	239	10 RR	53

Analysis:

Type A:

Sample sizes are too small to make inferences about skill gain.

Type B:

- Clients from the Northern region demonstrated significant gain in their reading skills. On average, each client scored 20 points higher on their post-test as compared to their pre-test.
- Clients from Central, Eastern and Western regions demonstrated significant skill gain ranging from 8 – 12 points.

O) Document use — comparison of pre- and post-test scores by assessment type and stream

The following tables present the scores of clients who completed document use pre- and post-tests.

Table O1 — comparison of filtered pre- and post-test document use scores by type

Assessment	Pre	Post	+/ Diff	N
Type A	123	149	26 NR	12
Type B	235	252	16 RR	135

Analysis:

Type A: Sample sizes are too small to make inferences about skill gain.

Type B: Clients scored 16 points higher on their Type B post-test compared to their Type B pre-test. This is a significant gain in skills.

SUMMARY	GENERAL INFO	METHODOLOGY	KEY FINDINGS	RESULTS/ ANALYSIS	RECOMMENDATIONS

Table O2— comparison of filtered pre- and post-test document use scores by stream

TYPE A	Pre	Post	+/ Diff	N
Aboriginal	N/A	N/A	N/A	0
Anglophone college	N/A	N/A	N/A	0
Anglophone community-based	130	140	11 NR	4
Anglophone school board	150	159	9 NR	1
Deaf	23	46	23 NR	2
Francophone college	N/A	N/A	N/A	0
Francophone community-based	152	195	44 NR	5
TYPE B	**Pre**	**Post**	**+/ Diff**	**N**
Aboriginal	231	261	29 MR	23
Anglophone college	226	239	13 MR	17
Anglophone community-based	247	256	10 RR	42
Anglophone school board	236	258	22 MR	18
Deaf	208	217	9 NR	7
Francophone college	N/A	N/A	N/A	0
Francophone community-based	234	225	15 MR	28

Analysis:

Sample sizes involving fewer than 15 test instances are not included in the analysis.

Type A: Sample sizes are too small for analysis.

Type B:

- Aboriginal clients scored 29 MR points higher on their Type B post-test compared to their Type B pre-test. This is a very significant gain in proficiency.
- Clients from Anglophone school boards clients scored 22 MR points higher on their Type B post-test compared to their Type B pre-test. This is a very significant gain in proficiency.
- Clients from Anglophone colleges had skill gains of 13 MR . This is a significant gain in skills.

SUMMARY	GENERAL INFO	METHODOLOGY	KEY FINDINGS	RESULTS/ ANALYSIS	RECOMMENDATIONS

Table O3— comparison of filtered pre- and post-test document use scores by location

TYPE A	Pre	Post	+/ Diff	N
Central	92	103	11 NR	4
East	146	219	73 NR	3
North	N/A	N/A	N/A	0
West	134	144	10 NR	5
TYPE B	Pre	Post	+/ Diff	N
Central	218	235	17 RR	127
East	243	255	12 RR	33
North	237	260	22 RR	37
West	237	245	8 RR	79

Analysis:

Type A:

Sample sizes are too small for analysis.

Type B:

- Clients from the Northern region achieved very significant gains in their document use skills. Their skills increased by 22 points.

- Clients from the Central region achieved significant gains in their document use skills. Their skills increased by 17 points.

- Clients from Eastern and Western regions also had gains, but they were not as significant. Eastern clients document use scores increased by 12 points, Western clients by 8 points.

SUMMARY	GENERAL INFO	METHODOLOGY	KEY FINDINGS	RESULTS/ ANALYSIS	RECOMMENDATIONS

P) Numeracy — comparison of pre- and post-test scores by assessment type and stream

The following tables present the scores of clients who completed numeracy pre- and post-tests.

Table P1 — comparison of filtered pre- and post-test numeracy scores by type

Assessment	Pre	Post	+/ Diff	N
Type A	149	154	5 NR	9
Type B	242	263	21 RR	247

Analysis:

Type A: Sample sizes are too small for analysis.

Type B: Clients scored 21 points higher on their Type B post-test compared to their Type B pre-test. This is a very significant gain in skills.

Table P1 — comparison of filtered pre- and post-test numeracy scores by stream

TYPE A	Pre	Post	+/ Diff	N
Aboriginal	145	145	0 NR	1
Anglophone college	164.5	164.5	0 NR	2
Anglophone community-based	173	173	0 NR	2
Anglophone school board	N/A	N/A	N/A	0
Deaf	97	111	14 NR	3
Francophone college	N/A	N/A	N/A	0
Francophone community-based	231	231	0 NR	1
TYPE B	**Pre**	**Post**	**+/ Diff**	**N**
Aboriginal	220	271	51 MR	19
Anglophone college	248	267	19 RR	153
Anglophone community-based	233	250	17 RR	47
Anglophone school board	240	266	26 MR	18
Deaf	232	254	22 NR	4
Francophone college	N/A	N/A	N/A	0
Francophone community-based	225	226	1 NR	11

Analysis:

Type A: Sample sizes are too small for analysis.

Type B:

- Aboriginal clients scored 5 MR points higher on their Type B post-test compared to their Type B pre-test. This is a very significant gain in proficiency.
- Anglophone school board clients scored 2 MR points higher on their Type B post-test compared to their Type B pre-test. This is a very significant gain in proficiency.
- Clients from Anglophone colleges and community-based demonstrated significant skill gain, with increases of 19 and 17 points respectively.

LEARNERGAINS

| SUMMARY | GENERAL INFO | METHODOLOGY | KEY FINDINGS | RESULTS/ ANALYSIS | RECOMMENDATIONS |

Table P3 — comparison of filtered pre- and post-test numeracy scores by location

TYPE A	Pre	Post	+/ Diff	N
Central	239	181	8 **NR**	5
East	N/A	N/A	N/A	0
North	N/A	N/A	N/A	0
West	160	20	0 **NR**	4
TYPE B	Pre	Post	+/ Diff	N
Central	248	268	20 **RR**	123
East	248	268	16 **RR**	39
North	227	268	41 **RR**	43
West	235	268	18 **RR**	42

Analysis:

Type A:

Sample sizes are too small for analysis.

Type B:

- Clients from the Northern region had 41-point skill gain. This is a very significant gain in skills.
- Clients from the Central, Western and Eastern regions had skill gains ranging between 16-18 points. These are significant gains in skills.

LEARNERGAINS

RESEARCH PROJECT
FINAL REPORT

SUMMARY	GENERAL INFO	METHODOLOGY	KEY FINDINGS	RESULTS/ ANALYSIS	RECOMMENDATIONS

Feedback from project participants

Feedback received by the Project Manager

Inquiries during the first two months of the project involved registration issues such as changing the individual registered for an organization, explaining why multi-site organizations required more than one account or explaining how to register test administrators.

Only two organizations required telephone step-by-step instructions to register test administrators. All the questions received were addressed in the user guides and explanations provided also included identification of the page in the user guide the question was addressed.

Several emails/telephone calls describing a learner's frustration or anxiety levels were received. In some cases, the test administrator had not read the "Required Reading Skill Level of Test Takers" page with a link to a downloadable form presented each time they sign in. This form can be used to document a learner exemption from completing the assessment. In other cases, the learner had these skills but the test administrator had helped the learner with the first six questions resulting in the learner being streamed to a full assessment instead of exempted.

Some test administrators felt that the assessments should be "less challenging" or "easier." Through discussion, most of these test administrators agreed that the learner's true skill level would not be known unless they were challenged.

Feedback about a statement in the Results Report about scores identified it as 'harsh and deflating' for clients scoring below 250: "A number score found in

brackets, such as (250). Number scores normally range between 200 and 300. It varies, but most jobs require reading skills at 250 or higher."

Test administrators receive an email with a test taker's score as they are completed. Several programs suggested it would be helpful if these were identified as pre- or post-test scores.

Several inquiries were received mid- to end of project requesting directions for post-testing. Directions were provided along with a reference to the page number in the user guide where instructions are included. Some programs re-registered clients to post-test and where this was identified the accounts were amalgamated.

The nature of the inquiries changed once test administrators became comfortable with the mechanics of ESEE. Emails and telephone calls seeking confirmation of results interpretation, suggestions for the use of the learning activities plans, ways to incorporate into learning plans and classroom activities, sources of additional materials, etc. became the norm.

COLLEGE SECTOR COMMITTEE
for **ADULT UPGRADING**
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SUMMARY	GENERAL INFO	METHODOLOGY	KEY FINDINGS	RESULTS/ ANALYSIS	RECOMMENDATIONS

Participant feedback received about technical and assessment-related issues

Users of the ESEE web application report errors and glitches by clicking a "Report an Error" link found on every question. Between January and November, approximately 130 errors/problem were reported by users of the system. Based on the proportion of regular users to clients, we believe that 44 of these reports likely came from project participants. Following is a breakdown of the type of issues reported and the response.

TECHNICAL ISSUES

Instances	Issue	Response
9	Image not loading	Reminded user about the image reload button
5	Buttons / images not loading	Informed user about bandwidth issue and suggested they not use wireless connection to take assessment
3	Navigation issues - test exited early - user error	Instructions provided
1	Glitches	Cause of glitch was identified and fixed.
1	Other technical issues (i.e. emails not being sent)	Instructions provided

ASSESSMENT-RELATED ISSUES

Instances	Issue	Response
6	Incorrect answer choices on assessment	Question reviewed and deemed correct - information provided to client
3	Question was confusing to test taker	An explanation of the question was provided and/or test administrator was contacted for follow-up
3	Potential answer not available	Explained that correct answer is available
3	Complaints about wording of questions or typos	Question was reviewed and the suggested change made.
2	Complaints about wording of questions or typos	Question was reviewed and no change was needed

MISCELLANEOUS

Instances	Issue	Response
4	General question (i.e. how to log in)	Answers were provided
2	Password related issue - lost or forgot	Login info provided or client referred to registrar
1	Incorrect result report	Issue corrected
1	Non-specific client complaints – rants/	

TRANSLATION-RELATED

Instances	Issue	Response
1	Translation-related issues	The translation was reviewed and fixed.

SUMMARY	GENERAL INFO	METHODOLOGY	KEY FINDINGS	RESULTS/ ANALYSIS	RECOMMENDATIONS

Recommendations

Based on the results of this project, the CSC is considering implementation of the following to improve the ESEE tool:

- To reduce test fatigue, cognitive load and lessen the need to complete assessments in multiple sittings, reduce the number of Type B numeracy questions from 40 to 30 and Type B reading and document use questions from 30 to 27.

- To collect more accurate test duration data, remove the ability for clients to complete a single assessment in multiple sittings.

- Place a timer on the assessment and ask clients to spend at least 15 minutes on each assessment.

- Differentiate emailed score reports sent to programs by labelling Pre-Test Scores and Post-Test Scores

- Revise the score description statement on Results Report

- Add another option in the introductory questionnaire for registrants who identify as other than male or female

To ensure the best experience for the client and the LBS service provider, the CSC is considering the following strategies:

- Develop strategies to ensure clients put their best effort toward their assessments

- Hold focus groups and/or other forms of discussions with clients and LBS program staff to ascertain how to best motivate clients to complete the post-tests.

- Program the ESEE web application to issue badges or other forms of recognition and motivation to recognize clients' efforts.

- Provide LBS service providers with the tools they need to better communicate the importance of these tests to clients