
CSMLS ONLINE SELF-ASSESSMENT TOOL FOR PLA READINESS OF INTERNATIONALLY EDUCATED MEDICAL LABORATORY TECHNOLOGISTS

FINAL REPORT



**CANADIAN SOCIETY FOR MEDICAL LABORATORY SCIENCE
SEPTEMBER 2010**

Report author
Moirá M. Grant, PhD FCSMLS(D)
Project Manager

For further information, please contact
Christine Nielsen, BHA, MLT, CAE
CSMLS Executive Director
ChristineN@csmls.org

Canadian Society for Medical Laboratory Science
PO 2830 LCD1
Hamilton ON L8N 3N8
905-528-8642 ext. 8684

TABLE OF CONTENTS

EXECUTIVE SUMMARY	1
BACKGROUND	3
PROJECT IMPLEMENTATION	4
TIMELINES AND ACTIVITIES.....	4
OUTCOMES	6
The Test Site.....	6
The Test Format	7
USER EVALUATIONS.....	9
Pilot test data	9
Post-Pilot Test Survey	9
Post-Survey Interviews	10
PROJECT EVALUATION	10
PROJECT OBJECTIVES	10
LIMITATIONS OF THE TEST	11
SUSTAINABILITY OF THE PROJECT OUTCOMES.....	12
PROJECT DISSEMINATION	12
COMMUNICATION TO STAKEHOLDERS	12
MARKETING TO POTENTIAL CLIENTS	13
CONCLUSION.....	13
APPENDIX A – Online Test Blueprint.....	15
APPENDIX B – Sample diagnostic report.....	16
APPENDIX C – Data from the Pilot Test Phase	19
APPENDIX D – Data from Post-Pilot Test User Survey	21
APPENDIX E – Findings from Participant Interviews.....	23
APPENDIX F – Acknowledgements.....	26

EXECUTIVE SUMMARY

The Canadian Society for Medical Laboratory Science (CSMLS) has developed an online test to provide internationally educated medical laboratory technologists with the guidance they require to engage successfully in credential assessment, to prepare for professional credentialing, and eventually to enter the workforce. The intention is to expedite the integration of skilled medical laboratory professionals into the Canadian healthcare workforce by providing would-be applicants to the CSMLS PLA program with a realistic, constructive and accessible tool for assessing their own readiness to enter the medical laboratory credentialing process. This report presents details about the project implementation, evaluation, sustainability and dissemination.

With funding from the Government of Canada's Foreign Credential Recognition Program, CSMLS has developed, piloted and implemented an online self-assessment tool for use by would-be applicants to the CSMLS PLA process. CSMLS engaged in test item production workshops, test construction and validation, psychometric evaluation, development of learning materials, and project dissemination activities.

The online test consists of a 100-item, 90-minute online test that covers the five major technical sub-disciplines of medical laboratory science as well as professional knowledge in safe work practices, specimen handling, and professionalism. The test is available in English and French. Health professionals in their home countries can create a user account on the test site and take the test after paying a fee. They have an opportunity to try out a 15-question practice test before attempting the full version. Those who complete the full test receive a diagnostic report on their scores in the eight test areas.

The online self-assessment tool developed through this project is considered to be a low-stakes test, meaning that it is for information and educational purposes only. The outcomes of the test have no bearing on a test-taker's status with the CSMLS. This test is not identical to the CSMLS certification examination in content, complexity or format, as it was developed to meet project goals and the specific needs of internationally educated clients who are in the early stages of seeking certification with the CSMLS. The online test will be available to CSMLS clients in the fall of 2010, with an implementation date to be determined by CSMLS.

The self-assessment tool developed in this project creates a more equitable PLA process by:

- making expectations for professional credentialing and workforce competencies explicit;
- permitting would-be PLA applicants to self-assess in a confidential low-stakes environment;
- increasing would-be PLA applicants' chances for success in the CSMLS PLA process by providing them with information that will help them to prepare their portfolios and to upgrade their knowledge and skills where needed;
- enabling IEMLTs to make informed decisions about their eligibility to work in the Canadian healthcare system, ideally *before* they arrive in Canada;
- providing preparation for the multiple choice test format;
- encouraging unqualified candidates to avoid the cost, time, and emotional investment of an inappropriate application to the CSMLS PLA process.

The overall result is the streamlining and increasing accessibility of information and processes for entering the Canadian medical laboratory profession, and the enhanced integration of a diverse population of IEMLTs into the healthcare workforce.

BACKGROUND

Medical laboratory science has been identified as one of Canada's five key professional groups requiring priority attention to human resources issues. At the time this project was undertaken, this profession was entering a period of pronounced workforce shortages. As in numerous professions, the integration of internationally educated professionals is considered to be an important strategy for addressing these shortages.

The Canadian Society for Medical Laboratory Science (CSMLS) is the national professional association and certifying body for medical laboratory technologists and assistants in Canada. The CSMLS administers a Prior Learning Assessment (PLA) program for candidates educated outside of Canada to establish their eligibility for the national certification examination. Successful completion of this examination constitutes the entry-to-practice criterion for medical laboratory technologists in nine provinces and three territories. The CSMLS assesses approximately 300 PLA candidates per year.

Many internationally educated medical laboratory technologists (IEMLTs) are unaware of their level of preparedness for the CSMLS PLA process. Less than 15% of PLA applicants are deemed to be equivalent (i.e., eligible to write the national certification examination) during their first PLA evaluation.^{1,2}

In 2006, the CSMLS PLA process underwent an external audit. One of the recommendations of the audit report was the development of screening tool that would give potential PLA candidates a clearer idea of the competencies expected during the CSMLS credentialing process and in the Canadian healthcare setting.³ CSMLS receives inquiries and PLA applications from individuals with widely varying degrees of experience in the competencies expected within the Canadian healthcare environment; some applicants have no medical laboratory background whatsoever.

With these points in mind, the CSMLS undertook development of an online test to provide IEMLTs with the guidance they require to engage successfully in the PLA program, to prepare for professional credentialing, and eventually to enter the workforce. The intention is to expedite the integration of skilled medical laboratory professionals into the Canadian healthcare workforce by providing would-be applicants to the CSMLS PLA program with a realistic, constructive and accessible tool for assessing their own readiness to enter the medical laboratory credentialing process and with information about the expectations of the Canadian healthcare workplace. One of the goals, therefore, is to encourage advance preparation and 'informed self-selection' by potential PLA candidates, ideally before they arrive in Canada.

The project was funded by the Government of Canada's Foreign Credential Recognition Program.

¹ Haley, B. & Simosko, S. (2006). *Prior learning assessment and internationally trained medical laboratory technologists: An investigative report for the Canadian Society for Medical Laboratory Science*. Ottawa: Canadian Association for Prior Learning Assessment.

² Grant, M. M. (2009). CSMLS prior learning assessment clients – A snapshot. *Canadian Journal of Medical Laboratory Science* 71(5), 194-203.

³ Haley & Simosko, (2006), cited previously.

PROJECT IMPLEMENTATION

Between April 2007 and September 2010 CSMLS developed, piloted and implemented an online self-assessment tool for use by would-be applicants to the CSMLS PLA process. This included a six-month extension to the original project in order to expand project activities and make best use of available funds. The CSMLS Research Ethics Board approved the project methodology.

TIMELINES AND ACTIVITIES

Table 1 on the following page details the activities of the project by fiscal year.

Several project activities merit further description. For example, CSMLS conducted a Request-for-Proposals process to identify and select the supplier of its online test platform.

The three ‘Test item writing workshops’ utilized the same process for developing the online test questions that CSMLS uses to create questions for its certification examination. The workshops consist of 3 to 4 days of question development and critique by 14 to 18 subject matter experts, CSMLS staff, and individuals experienced in construction of competency-based professional examinations. This intensive process is highly productive, resulting in approximately 300 validated test questions per workshop. The project budget had originally included two of these workshops; a third was added, as part of the project extension mentioned earlier, in order to make full use of remaining project funds. This has resulted in a substantial bank of almost 900 English questions (and almost 600 French questions).

An added feature of this project’s item writing workshops was the opportunity they provided CSMLS to invite Canadian-certified IEMLTs to participate in the workshops as subject matter experts. Three IEMLTs participated in the first workshop, four in the second, and five in the third. These individuals provided valuable insight and guidance for their colleagues.

The six-month extension of the project to facilitate use of unspent project funds allowed CSMLS to enhance the online test with additional project activities. The online test consultants, ProTraining, brought their psychometrist into their team; this additional expertise will enhance the validity of the test and provide CSMLS with ongoing statistical data and guidance in maintaining the test. ProTraining is creating a video for test-takers on how to take multiple-choice tests. This will be extremely useful for CSMLS’s clients, as many have not encountered multiple-choice formats in their academic careers. Previous research has demonstrated that IEMLTs experience greater success in second or later examinations.⁴ Many IEMLTs attribute their initial difficulties to the challenges of encountering CSMLS’s competency-based questions for the first time when then attempt their first certification examination. The practice online test, and indeed, the entire online test, provide IEMLTs with the opportunity to familiarize themselves with multiple choice testing. The project extension/expansion also allows CSMLS to conduct promotional campaigns using print and radio media (see the “Project Dissemination” section for further information).

⁴ Grant, M. M. (2009). CSMLS prior learning assessment clients – A snapshot. *Canadian Journal of Medical Laboratory Science* 71(5), 194-203.

TIME FRAME	PROJECT ACTIVITIES
April 2007 – March 2008	<p>PROJECT PLANNING</p> <ul style="list-style-type: none"> • Investigation of software for online testing platforms • Identification of key project participants and consultants • Scheduling of project activities • Research ethics approval process • Consultation with IT team
April 2008 – March 2009	<p>TEST ITEM DEVELOPMENT</p> <ul style="list-style-type: none"> • Needs analysis • Development of test blueprint • Inventory of available ‘decommissioned’ test items • Item writing Workshop 1 • Test item translation to French • Test item benchmarking (CLB) <p>ADAPTATION OF TEST TO ONLINE FORMAT</p> <ul style="list-style-type: none"> • Creation of pilot version of test • Development of user diagnostic feedback report • Troubleshooting online test • Pre-pilot testing with CSMLS staff, subject matter experts
April 2009 – March 2010	<p>PILOT TESTING</p> <ul style="list-style-type: none"> • Evaluation of online test by CSMLS clients • Completion of online survey by test participants <p>TEST ITEM BANK EXPANSION</p> <ul style="list-style-type: none"> • Item writing Workshop 2 • Test item translation to French • Test item benchmarking (CLB)
April 2010 – September 2010	<p>PILOT TESTING (continued)</p> <ul style="list-style-type: none"> • Follow-up interviews with online test participants <p>PSYCHOMETRIC ANALYSIS</p> <ul style="list-style-type: none"> • Test form construction • Test form validation <p>ADDITIONAL FEATURES</p> <ul style="list-style-type: none"> • Development of video on multiple choice testing • Preparation of French version of test <p>TEST ITEM BANK EXPANSION</p> <ul style="list-style-type: none"> • Item writing Workshop 3 • Test item benchmarking (CLB) <p>MARKETING</p> <ul style="list-style-type: none"> • Development and implementation of marketing plan <p>ONLINE TEST FINALIZATION</p> <ul style="list-style-type: none"> • Proofreading/updating site pages • Migrating site from pilot phase to full testing phase

TABLE 1: Project activities in each fiscal year.

Finally, as language proficiency has been identified as a potential barrier for IEMLTs^{5,6}, this test was developed with English-as-a-second-language (ESL) language consultants, as well as with the newfound plain language expertise of CSMLS staff acquired as a result of a previous project supported by the Foreign Credential Recognition Program.⁷ This has resulted in a clear and linguistically accessible testing process, while orienting IEMLTs to the communicative and technical requirements of the Canadian healthcare workplace.

OUTCOMES

The main outcome of the project is the online testing tool. This section introduces the online test site and provides details about the test itself.

The Test Site

The online test site can be previewed at <http://csmls.protraining.com/>. Full functionality in both English and French will be available in mid-October 2010. See Figure 1 for an image of the site home page.

FIGURE 1: The test site home page



⁵ Haley & Simosko, (2006), cited previously.

⁶ Strachan, A. (2007). English language proficiency and internationally educated medical laboratory technologists: An investigation of language benchmarks and assessment tools for IEMLT success. Toronto: Author

⁷ CSMLS Internationally educated medical laboratory technologists communications project. (Completed 2008 with funding from the Government of Canada's Foreign Credential Recognition Program).

Visitors to the site can learn more about the test by reading the FAQ (Frequently Asked Questions)-type page called “Learn More”. They can go directly to the “Purchase Now” page to create a user account and pay for the examination. Once they have paid, they have 30 days to complete the examination. They are advised to begin the test only when they are ready as the test must be carried out in one sitting. They will receive emailed reminders of the approaching test deadline. They may take a free 15-question practice examination first to familiarize themselves with the test format. Test-takers can access the test only by supplying the username and password they created when they initially registered on the test site. Test-takers may also view the instructional video on multiple choice testing before they take the test.

The CSMLS gave careful consideration to the decision to charge a fee for the test. CSMLS is sensitive to the feedback it has received on the economic burden that certification presents for internationally educated clients.⁸ However, there were certain factors that suggested that a small fee per test would be advisable. Charging a fee would:

- create a sense of value for the test, as test-takers may not value a product they can get for free;
- encourage test-takers to ensure that they are ready for and committed to the test before they begin it;
- discourage frivolous test taking (‘churning’ through the test forms);
- provide CSMLS with a small revenue for future expenses in updating the test and the test item banks;
- partially defray the ongoing cost of maintaining the web site.

The “About Us” page offers a brief introduction to the CSMLS, while technical support is available directly on the “Support” page (however, ProTraining can offer this service in English only).

The Test Format

There are four forms (versions) of the test in English and one in French, with a second French form in development. CSMLS receives fewer than five francophone PLA applicants per year;⁹ the proportion of forms for the two languages reflects the demand for the online test that can be expected in the two languages. Multiple forms permit rotation of the versions used and allow candidates to take the test more than once without encountering the same test.

Each test contains 100 multiple choice questions in the five main technical sub-disciplines of medical laboratory science (hematology, transfusion science, clinical microbiology, clinical chemistry, and hematology) as well as expectations for competent practice (safe practices, specimen collection and handling, professionalism). The distribution of these questions was mapped out before test construction in a ‘blueprint’ (see Appendix A). Each test form follows this blueprint. This is the same practice that CSMLS uses for laying out the content of its certification examinations.

Each question appears on its own page (see Figure 2 for a sample test item page) and consists of a question and four options. This, too, is the same format that CSMLS uses for its certification examinations. Test-takers select the ‘best’ answer (as instructed at the start of the test) and submit their

⁸ Grant, M. M. (2009). Bridging programs for internationally educated medical laboratory technologists: A business case. Hamilton: CSMLS.

⁹ T. Toffner, CSMLS Director, Certification & Prior Learning Assessment, personal communication, 2010/09/26.

answer by clicking on the 'Submit Answer' button. They can move back and forward through the exam without answering questions. A pop-up list of commonly-used acronyms is available from the test question page. When test-takers have completed the final question, they can view a list of answered and unanswered questions. They have the option of going back to answer the blank questions. When they are ready, they may submit their complete set of test answers. They have 90 minutes to complete the test. They may pause the test but must complete it in one session.

Figure 2: A sample test item page

The screenshot shows a web interface for the Canadian Society for Medical Laboratory Science. At the top, there is a header with the society's name in English and French, a logo featuring a stylized maple leaf, and a photo of five professionals. Below the header is a navigation bar with links: Home, Learn More, Purchase Now, About Us, Support, Your Account (Maira Grant), and Log Out. The main content area is titled 'No Time Limit' and includes a progress bar with 'Prev', 'Next', and 'Bookmark' buttons. The question is 'Which analyte is commonly detected in pregnancy tests?'. The options are: Estrogen, Human chorionic gonadotropin, Human cardiac troponin, and Prolactin. At the bottom of the question area is a 'SUBMIT ANSWER' button.

The submitted test is marked immediately, and the test-taker is taken to a page with a report on their test performance. (See Appendix B for a sample diagnostic report.) This diagnostic function is a strong feature of this online testing tool. The report details the participant's performance on the test and provides specific information on their strengths and knowledge/skills gaps in each of the eight areas defined by the blueprint. With this information, IEMLTs are in a good position to address the identified gaps before they apply to the CSMLS PLA process, and ideally, before they enter Canada.

The report also provides the test-taker with feedback on their performance at different levels of test item complexity (Recall and Application) and at differing levels of English language proficiency (CLB 5-6 and CLB 7-8).

While the report guides test-takers in the interpretation of their test results, it avoids absolute statements about the individual's prospects for successful PLA and certification with the CSMLS. This is

consistent with the CSMLS's intention that this test should offer a low-stakes informative and educational experience.

USER EVALUATIONS

The CSMLS conducted several types of evaluations of the online test with users. Before pilot testing the online test, CSMLS asked CSMLS staff and the item-writing subject matter experts to take the test and provide feedback on the test format and site content.

Pilot test data

In early November 2009, CSMLS sent out email messages to over 300 candidates for the February 2010 certification examination inviting them to participate in the pilot testing of the first draft version of the online test. This pool of candidates included IEMLTs and graduates of full-time Canadian medical laboratory programs. In the pilot phase between November 2009 and June 2010, the test was accessed 232 times. See Appendix C for a summary of the demographic data and performance of the test-takers.

As indicated in the comparative data reported in Appendix C, pilot test participants who were graduates of full-time Canadian medical laboratory programs demonstrated significantly higher overall test results than did internationally educated test participants. There was no difference in the performance of test-takers who reported English as a first language when compared with those whose first language is 'Other' (non-French). CSMLS may wish to investigate such findings further once the online test is in full use and the participant numbers are high enough to yield statistically valid findings.

Post-Pilot Test Survey

All individuals who completed the pilot test received an invitation to provide feedback on their test experience *via* a link to a SurveyMonkey™ survey. The survey was optional, and 68 individuals chose to participate. Appendix D contains a summary of the responses.

As noted in the appendix, survey participants found the online test fairly easy to navigate and complete. Fewer than half accessed the Frequently Asked Questions page (now called "Learn More"). In response to this, the home page now contains a recommendation that visitors access the Learn More page first.

Just slightly more than two-thirds of respondents reported that they understood the diagnostic report's feedback on language proficiency. CSMLS may wish to monitor this once the test is fully implemented.

As noted in Appendix D, it was apparent from the survey comments that participants regarded the online test as a preparation for the CSMLS certification examination although the test site contains cautions in several locations that the online test is not intended to serve this function. CSMLS's promotional messaging will avoid implying this preparatory role. However, it is inevitable that individuals will access the test with varying goals in mind, including examination preparation.

The final observation on the data from this survey concerns respondents' requests to be informed of the correct answers to the questions they answered incorrectly. With its certification examinations, CSMLS has consistently maintained a policy of non-release of questions from its question bank. Maintaining a

secure and confidential question bank is a priority, both in terms of test validity and of costs for replacing compromised test items. CSMLS has applied this same policy to the online self-assessment test. However, there is some pedagogical value to helping test-takers understand where they went wrong. CSMLS may choose to monitor this situation once the test is fully implemented with a view to enhancing this potential learning value of the test. For example, if the diagnostic report were expanded to include feedback on test-taker's performance in the sub-levels of the current test item categories, this might help test-takers to focus their remedial efforts without the need to reveal the test items themselves. Test items in the five technical categories are already grouped into sub-categories (for example, instrumentation, calculations, and quality control); the diagnostic report could be expanded to report on performance at that level.

Post-Survey Interviews

Of the 68 individuals who completed the post-test survey, 23 indicated that they would be willing to answer further questions about their online test experience. When contacted, seven of these agreed to participate in an interview. This follow-up stage had originally been planned as a series of focus groups. However, the small number of participants as well as their geographical dispersion (Europe and across Canada), made face-to-face focus groups impractical. The researcher conducted the interviews by telephone, using a semi-scripted format of six main questions. Interviews were not recorded; however, the researcher made detailed field notes and sent them to the individual interviewees for validation. This amendment to the research methodology was approved by the CSMLS Research Ethics Board.

Appendix E presents respondents' comments, sorted by question. Interviewees' comments echoed the survey responses in their positive reactions to the availability of the test and in their wishes to see where they responded incorrectly to test questions.

With respect to respondents' suggestions about what they would like to see changed on the test, one individual suggested that the questions be organized by subject area. This feature has been added to the online test. CSMLS might wish to consider other suggestions (for example, adding more test items or changing the criteria for acceptable performance) in the future.

PROJECT EVALUATION

This evaluation of the project addresses its achievement of the project objectives and the limitations of the test.

PROJECT OBJECTIVES

The original objectives of the project, as stated in the initial project proposal are:

1. To develop, pilot and implement an online self-assessment tool that will be used by would-be applicants to the CSMLS PLA process
2. To provide online self-assessment opportunities in both English and French.

3. To enhance the success rate of those who *do* apply to the PLA process by offering them an opportunity to orient themselves and align their portfolios to the expectations and credentialing/examination standards of the Canadian medical laboratory profession
4. To permit the CSMLS to employ its resources more effectively by ensuring PLA candidates are prepared for the process
5. To orient IMELTs to the communicative and technical requirements of the Canadian healthcare workplace

The test will be implemented in both English and French, meeting objectives 1 and 2, in the fall of 2010 once CSMLS carries out its governance, policy and promotional processes. Assessing the success with objectives 3, 4, and 5 awaits full implementation of the online test and later multi-year impact studies.

The project has also achieved outcomes not anticipated in the original objectives: (1) orienting IEMLTs to multiple choice testing through the practice test and educational video; (2) enhancing the validity of the test through psychometric consultation and analysis; (3) creating an even larger test item bank than originally planned through a third item-writing workshop; and (4) marketing the online test to international communities through targeted promotional strategies. The Foreign Credential Recognition program supported these additional activities with a six-month expansion/extension of the project.

In addition, the online self-assessment test offers CSMLS a valuable opportunity to examine application of computer-based testing in a low-stakes testing environment.

LIMITATIONS OF THE TEST

It is worthwhile to keep in mind that there are several known limitations to the online self-assessment tool. These are not flaws in the test, but simply *caveats* for its use and promotion.

1. The online self assessment tool is not a valid preparation tool for the CSMLS certification examination. It differs in terms of
 - a. its online format (the CSMLS exam is paper-based);
 - b. its shorter length (90 minutes rather than two exams of 3 and 2 ½ hours)
 - c. its use of high-resolution digital images (not feasible in the paper-based exam);
 - d. the lower complexity level of its questions (it is primarily knowledge/recall based, with some application and little demand for critical thinking);

The online test site and the diagnostic report make this limitation clear to test-takers.

2. The guidance provided on Language Proficiency in the diagnostic report has no validity as an assessment of English language proficiency (and in fact, may be confusing for those whose first language is English). This is indicated clearly in the report. CSMLS may choose to monitor the usefulness of this indicator for its clients.
3. The online self-assessment tool is subject to the US Patriot Act. CSMLS originally hoped to avoid this because the CSMLS is sensitive to the uncertain political climates from which its clients may originate. In fact, one of the factors for selecting the present test site consulting firm was the fact that their server was located in Canada. However, the firm's subsequent consolidation with a U.S.-based firm, the relocation of its servers to a US location, and the expansion of security-focused monitoring of global online activities make it almost impossible to create a testing

environment that does not fall under the US Patriot Act. The online test site makes this clear to its test-takers before they create a user account.

SUSTAINABILITY OF THE PROJECT OUTCOMES

Once CSMLS has carried out appropriate governance and policy reviews for implementing the online self-assessment tool, CSMLS expects to make the test a part of its PLA-preparation processes.

Following the end of the official project period (September 30 2010), ProTraining, the online test administrator, will carry out the following:

- site administration and maintenance for both English and French tests
- site technical support for test takers and the designated CSMLS administrator(s); support available in English only
- providing access to test site administration pages for designated CSMLS representative(s)
- furnishing exam/test item statistics and relevant analysis when available
- completion of the video on multiple choice testing and posting to the website; available in English only

After the project end date, CSMLS will carry out the following:

- assumption of the quarterly fees for site administration and maintenance
- governance and policy review to determine the best use of the new online test in the CSMLS PLA process
- communication and continued marketing of the test and project outcomes
- periodic evaluation of the online test process and contents, and of the testing statistics, to ensure continued validity, accuracy and utility
- periodic sampling of the test-taking client base (through surveys or personal contact) to assess the continuing usefulness of the test
- updating of the test and test site pages as needed.

PROJECT DISSEMINATION

The two main strategies for disseminating the outcomes of the projects are communication to professional stakeholders and marketing to potential IEMLT clients.

COMMUNICATION TO STAKEHOLDERS

- Internal governance processes: Council on National Certification, Board of Directors
- Final project report: distribution
- CJMLS announcement of project completion
- Circulation of key findings to Canadian medical laboratory educators in full time and bridging programs
- Global dissemination through CSMLS membership in the International Federation of Biomedical Laboratory Science

- Presentations to the CSMLS membership at its annual Congress
- Presentations to the annual meeting of the Canadian Association of Medical Laboratory Educators
- Sharing of key findings with additional parties of interest in this project; for example, CSMLS National Regulatory Council, CMA Assembly of Health Science Professions, Collaborative Forum on Health Science Education, Canadian Association for Prior Learning Assessment, Canadian Network of National Associations of Regulators
- Sharing best practices with other professional associations and foreign-credential-recognition organizations

MARKETING TO POTENTIAL CLIENTS

CSMLS staff will inform clients making inquiries about PLA and CSMLS certification that the online test is available. In addition, the CSMLS has planned two main marketing strategies for informing international professionals more widely about the online self-assessment test.

1. Print media: The CSMLS has developed a one-page post-card type flyer that will be distributed in French and English to immigration services offices;
2. Radio advertisement campaign: The CSMLS has identified radio stations in Toronto, Calgary, and Vancouver that serve South Asian populations (the principal communities for IEMLT newcomers to Canada). CSMLS has contracted for messages that will inform listeners of the availability and purpose of the online test in English or in the language of the target population.

The marketing campaign will take place in late Fall 2010.

CONCLUSION

This report has outlined the project activities and outcomes of a project carried out by the Canadian Society for Medical Laboratory Science. The self-assessment tool developed in this project creates a more equitable PLA process by:

- making expectations for professional credentialing and workforce competencies explicit;
- permitting would-be PLA applicants to self-assess in a confidential low-stakes environment;
- increasing would-be PLA applicants' chances for success in the CSMLS PLA process by providing them with information that will help them to prepare their portfolios and to upgrade their knowledge and skills where needed;
- enabling IEMLTs to make informed decisions about their eligibility to work in the Canadian healthcare system, ideally *before* they arrive in Canada;
- providing preparation for the multiple choice test format;
- encouraging unqualified candidates to avoid the cost, time, and emotional investment of an inappropriate application to the CSMLS PLA process.

The overall result is the streamlining and increasing accessibility of information and processes for entering the Canadian medical laboratory profession, and the enhanced integration of a diverse population of IEMLTs into the healthcare workforce.

The CSMLS appreciates the support of the Government of Canada's Foreign Credential Recognition Program and the time and expertise of the consultants, facilitators and subject matter experts who contributed to this project.

APPENDIX A – Online Test Blueprint


This exam 'blueprint' is the plan that outlines the distribution of test questions among the eight major subject areas. This blueprint is similar, but not identical, to the blueprint that CSMLS uses for its national certification examination.

SUBJECT AREA	PROPORTION OF QUESTIONS (%)
Clinical Chemistry	15
Clinical Microbiology	15
Hematology	15
Histology	15
Transfusion Science	15
Safe Work Practices	10
Specimen Handling	10
Professionalism	5

The four English forms (versions) and the two French forms of the online test follow this overall blueprint. The five technical subject areas (the first five listed in the table) are further broken down into sub-categories.

APPENDIX B – Sample diagnostic report

Page 1 of a sample diagnostic report


DIAGNOSTIC REPORT
PILOT - CSMLS Self-Assessment for Medical Laboratory Technologists

NAME: X X
TEST COMPLETED: Dec 31, 2009 1:46 PM
CLIENT #: 522645

OVERALL TEST PERFORMANCE

This bar chart provides a general picture of your performance on the test. Review the sections on the next pages for more detail on the individual sections.

Clinical Chemistry	94%
Hematology	100%
Histology	93%
Microbiology	80%
Professionalism	100%
Safe Work	90%
Spec Collection	100%
Transfusion Science	100%
Total	94/100

If your score is ...

ACCEPTABLE Greater than 70%	Your knowledge may be sufficient to meet Canadian requirements for this subject area
BORDERLINE 55 to 70%	You may have difficulty demonstrating sufficient knowledge in this area if you wish to enter the Canadian medical laboratory profession
UNACCEPTABLE Less than 55%	You have not demonstrated knowledge expected of a Canadian medical laboratory technologist in this subject area.

If you have one or two subject areas with a 'borderline' or 'unacceptable' rating, we recommend that you upgrade your knowledge using the resources listed in the next section of the report. If you have three or more subject areas with a 'borderline' or 'unacceptable' rating, we recommend that you consider a bridging program for internationally educated medical laboratory technologists or a full-time Canadian medical laboratory science program.

PERFORMANCE IN INDIVIDUAL SUBJECT AREAS

These questions assessed your knowledge of professional practice related to safe work practices, specimen collection, professionalism, hematology, clinical chemistry, histology, microbiology, and transfusion science.

You can find more information on Canadian medical laboratory practice by consulting these resources:

- CSMLS [continuing education](#) courses
- The CSMLS [competency profile](#) [PDF]

TAXONOMIC LEVEL

This part of the report gives you feedback on how you performed at two different levels of difficulty on the test. We design the CSMLS certification examinations at three different levels:

Recall	This is the simplest type of question. It requires you to remember a piece of information.
Application	At this level, you need to know certain information and use it to solve a simple problem.

This online test consists mainly of 'recall' questions with a smaller number of questions at the 'application' level. Your scores for the taxonomic levels on this test may give you an idea of how successful you might be at meeting the requirements of the CSMLS certification examination.

At the 'Recall' level you answered **85** out of **90** questions correctly. Your recall of medical laboratory knowledge is **ACCEPTABLE**.

At the 'Application' level you answered **9** out of **10** questions correctly. Your application of medical laboratory knowledge is **ACCEPTABLE**.

If your scores for the Taxonomic Level are less than 70% in total, you will find it very difficult to demonstrate the required knowledge and competence to meet the standards for medical laboratory practice in Canada.

LANGUAGE PROFICIENCY

This online test is not an official language proficiency test. However, each question has been checked for its language proficiency level using the Canadian Language Benchmarks (CLB). Here is your score for the test questions:

- At CLB 5 to 6 you answered 61 out of 64 questions correctly
- At CLB 7 to 8 you answered 32 out of 35 questions correctly

If you choose to apply to the CSMLS prior learning assessment process, you will need to demonstrate language proficiency at a CLB Level 6 on an official language proficiency test (TOEFL iBT, IELTS, or CanTEST). You will need to demonstrate proficiency at a CLB Level 8 in order to write the CSMLS certification examination after you have successfully completed the prior learning assessment. Professional practice in the Canadian laboratory workplace involves language proficiency at a minimum level of CLB 8.

Your scores for the questions on this test may give you an idea of how successful you might be at meeting these requirements. If you had difficulty with questions at CLB 5 to 6, we recommend that you take upgrading courses in English as a Second Language (ESL) before you proceed with your application to CSMLS.

CONCLUSION

The sections of this diagnostic report should help you to have a better understanding of your knowledge of the important areas of practice in medical laboratory science in Canada.

'Acceptable' performance on this test does not mean that you will be successful on the CSMLS certification examination or in the CSMLS prior learning assessment process. This test is not intended to provide preparation for the certification examination.

'Borderline' or 'Unacceptable' performance in this test does not mean that you will never be a medical laboratory technologist in Canada. However, if you are an internationally-educated health professional, you should use this information to help you to gain the necessary education and work experience before you apply for prior learning assessment at the CSMLS. We hope this will be helpful for you as you make decisions about your future in the profession.

This evaluation was prepared for research purposes. The results do not affect your status with the CSMLS.

Please keep a copy of this report. You may wish to submit it to the CSMLS at some time, or you can use it to monitor your progress if you choose to take the test again at a later time.

APPENDIX C – Data from the Pilot Test Phase

DEMOGRAPHICS OF PILOT TEST PARTICIPANTS

Test-takers completed supplied these data as part of the creation of their user account.

N=210 completing this field

CURRENT STATUS	%	n
Internationally educated professional	49.5	104
Student in full-time program	35.7	75
Student in bridging program	4.8	10
Other	10.0	21

Note: 'Other' includes 3 subject matter experts who provided feedback on the pilot test.

N=208 completing this field

COUNTRY OF MLT EDUCATION	%	n
Canada	44.2	92
India	16.8	35
Philippines	16.8	35
China	3.8	8
Nigeria	3.8	8
France	2.9	6
United Kingdom	1.9	4
Other	9.6	20

Note: The 'Other' category includes, in order of decreasing mention: United States, Pakistan, and countries in Africa, the Middle East, Asia, Central America and Europe.

N=211 completing this field

FIRST LANGUAGE SPOKEN	%	n
English	66.8	141
French	3.3	7
Other	29.4	62

'RETAKES' – MULTIPLE ATTEMPTS

Most individuals took the online test just once. However, at least 18 of the 232 attempts were 'retakes' (for example, one individual took the test 7 times). Because some individuals may have created multiple profiles using different names, it is possible that the re-take incidence is greater than can be determined from user names.

The 'retakes' that are readily identifiable (same name and user number) prompt questions on test performance:

INDIVIDUAL	Attempt 1 %	Attempt 2 %	Attempt 3 %	Attempt 4 %	Attempt 5 %	Attempt 6 %	Attempt 7 %
A	24	74					
B	61	49					
C	62	53					
D	70	72					
E	73	65					
F	74	71					
G	74	68					
H	78	81					
I	78	83					
J	85	88					
K	89	89					
L	91	94					
M	68	70	74				
N	69	71	63	71	73	72	70

With the exception of the first two individuals, the results appear to be fairly consistent among test scores for the same person. This small set of findings requires confirmation with a larger population before any conclusions can be made about the reproducibility of test results.

COMPARATIVE TEST PERFORMANCE DATA

COMPARING GROUPS BY STATUS

STATUS	n	AVERAGE TEST SCORE
Internationally educated professional	104	66%
Student in full-time program	77	78%
Student in bridging program	10	70%

The difference in average test scores between the internationally educated professionals and the students in full-time programs who took the pilot test is statistically significant ($p < 0.0001$). The numbers of students in bridging programs is too small to yield statistically valid results.

COMPARING GROUPS BY FIRST LANGUAGE SPOKEN

STATUS	n	AVERAGE TEST SCORE
English	142	71%
Other	62	72%
French	7	78%

There is no statistical difference in the average test scores of participants in the pilot test who indicated that English is their first language spoken as compared to those who indicated 'other'. The number who indicated French as a first language is too small to yield statistically valid results.

APPENDIX D – Data from Post-Pilot Test User Survey

The main part of the survey consisted of 14 statements, to which the participant was asked to respond ‘yes’, ‘no’, or ‘not sure.’

STATEMENT	YES (%)	NO (%)	NOT SURE (%)
The test web site was easy to navigate	95.5	3.0	1.5
The website provided clear information	97.0	1.5	1.5
I read the FAQs (Frequently asked questions) information page	41.8	49.3	9.0
I was able to log in easily	97.0	3.0	0
The instructions for the test were clear	100.0	0	0
I was able to review or change my answers easily	68.7	16.4	14.9
When the question referred to an image, the image was included	94.0	4.5	1.5
I finished the test in the 90 minutes provided	94.0	4.5	1.5
The test questions were easy to answer	50.0	26.9	22.4
It was easy to download my report	95.5	1.5	3.0
I understood the report information about my overall test performance	95.5	3.0	1.5
I understood the report information about the taxonomic level	80.6	9.0	10.4
I understood the report information about language proficiency	68.7	19.4	11.9
I can use the report’s information to prepare myself for professional activities	92.4	0	7.6

More than half of the survey participants (38) provided responses to the question “Is there any other information you’d like to give us about your experience with the online test?” Most of the responses expressed appreciation for the test. For example:

This was a great thing for us to do to test our knowledge. Thank you for the opportunity

Great format!!

I found the test a good means of finding out which areas I need to focus on.

This is very beneficial to IEMLTs, as they gain an insight of the level of knowledge and application of that knowledge, which is required to practice their profession in Canada.

Although the online test is not intended to serve as a preparation for the CSMLS certification examination (and this is explained to participants on the test site pages), it was apparent from the survey comments that participants regarded the online test as having this function.

I am thankful to have had the opportunity to try this test out, as it gives me a much clearer idea about what to expect when i write my exam.

The test was nicely written and helpful for giving me an idea of what to cover for the CSMLS exam.

It helped me understand the level of detail in knowledge that is expected for the CSMLS certification exam.

By far, the greatest number of comments contained suggestions that the correct answers should be provided to test-takers.

It would be much better if the report indicates which questions were answered incorrectly.

You should be able to see which questions you got right and which you got wrong.

The only thing that I could recommend would be to give more information at the end...not necessarily the answer to the question, which would be nice, but possibly which ones I got wrong.

Can I get paper back with answer to know where I was wrong.

The several comments on the diagnostic report were mixed, referring to the report as 'helpful', 'complex' and 'confusing.'

The final question in the survey asked, "May we contact you about participating in a focus group (small group meeting) to discuss the online test?" Slightly less than half of respondents (28 individuals) indicated a wiliness to participate, and provided their contact information (email address).

APPENDIX E – Findings from Participant Interviews

Of the 28 individuals who indicated an interest in providing further feedback on the online test, seven agreed to telephone interviews. This appendix presents the field notes on respondents' comments, sorted by question.

Why did you take the CSMLS online self-assessment test?

I just graduated. I was using [the online test] to gauge if I was prepared for the CSMLS [certification] exam.

I was preparing for writing the CSMS exam. I thought it would be good for practice and provide a brief preview and some benchmarks for studying. Also, because I knew the test was being developed for internationally educated technologists, I wanted to contribute to the study.

I wanted to get an idea of the style and format of the test to tell me what I could expect on the CSMLS certification exam.

I received an email about the test and wanted to go through the questions to practice for the CSMLS certification examination. I knew that the online test was different from the paper-based CSMLS exam.

The system of practice in Canada is quite different. I wanted to get some information. I also wanted to get confidence from the online test.

I thought it would be helpful in my CSMLS exam. It is the first time I am going to write with CSMLS. I didn't know about any Canadian exams.

I was writing the CSMLS exam in February. I thought the online test would better prepare me for it. I wrote it in January. We don't have multidisciplinary laboratory work in Europe so I thought the online test would be good practice.

Did you find the test helpful?

Yes. It was helpful for pointing out in which areas I was weak. I went back to concentrate on my weakest areas to prepare for the certification exam.

The bar chart report showed me my strengths and weaknesses. It provided a brief snapshot of where I was. Because I was doing my clinical rotations at the time, I wasn't able to change a lot about my preparation. But I felt more confident about the areas where the report showed my strengths and I was able to pay more attention to my weak areas.

Yes, the format was very similar [to the CSMLS exam]. But in terms of the difficulty level, I found it a lot easier.

The questions were pretty much the same. The online test was good because it had the images. A few questions, but not too many, should have images on any exam.

I didn't get much additional information about Canadian practice. I learned about the system of examination. I feel I was confident with that kind of examination.

It was good for learning about multiple choice tests. I wrote lots of exams back home but not like this. It was good to write a test related to CSMLS. I haven't tried the CSMLS certification exam yet. I am going to write it next February.

It was, a bit – quote helpful, but I still failed the [CSMLS certification] exam. It was disappointing and expensive. The test was useful for helping me to understand expectation of the profession in Canada.

The way we practice in Europe is very different. If I can't get into my chosen profession, there is no point in bringing my family to Canada. I have practiced for more than 20 years. My training in Med Lab Sciences was a general one but my specialty is microbiology and I also have substantial working experience in other fields of pathology. The online test was useful for helping me to understand expectations of the profession in Canada.

Did you take it more than once?

No(3).

I took it twice. I noticed that many of the questions were the same, but in a different order.

I think I took it only once.

I took it twice. The first time I took it without any preparation, and then I knew what the test was like before I took it again. Also, the first time my daughter was home while I wrote the exam, but not the second time.

Twice. I was getting better the second time -- slightly better the second attempt. I saw some questions again on the second test and I already knew the answers to them from the first time.

What would you change about the test if you could?

It's OK. It could be better if the questions were organized subject-wise rather than mixed up. Sometimes it is helpful to know the name of the subject that the question belongs to.

I'd like to know which questions I got wrong specifically or where I could research the answers to the questions.

I had some issues with specific questions. One question didn't offer a best possible answer – what I was taught wasn't offered as an answer. One clinical scenario may have been specific to a clinical environment and didn't offer what I felt was the best answer. I made a note of these in my responses to the online survey.

It would be helpful if there was a greater volume of questions to create a sense of urgency. I found it was kind of relaxed and I could take my time. I didn't feel as pressured as I did with the certification exam.

Nothing. It was good.

It is a very good test. It covers the CSMLS test blueprint. I would change the marking criteria of who is competent to practice in Canada. The margin of success is very narrow. It is not very accommodating. CSMLS needs to use a level of 70% as a pass rate. Not necessarily lower the standard but to be a bit more liberal. I hope CSMLS will do a discipline-specific exam in the future. CSMLS should provide more feedback on the online test. Not just overall feedback but on performance on each question. CSMLS should use a bigger pool of questions – use more than 100, closer to the 300 of the CSMLS [certification] exam.

Do you feel it would be useful for internationally educated MLTs who wish to become certified in Canada?

Yes (2).

It certainly would be useful. It is at a different level than school-based testing, pretty close to the actual CSMLS exam I wrote. Internationally educated technologists should be at that standard. Yes. I especially like how at the end they gave you a scoring of the sections, showing strengths and weaknesses. This would be good for potential MLTs.

Definitely. There could be more questions. 100 is fine. 120 would be better.

Very helpful. It would be more helpful with situational questions.

The questions could be more case-specific. For example, give a situation and ask what you would do.

I suppose it would be.

Do you have any questions or additional comments?

Even if the test was meant for international students, I found it reassuring to know what kinds of questions would be on the test and how I would do.

Will this test be offered as a tool for bridging programs?

I would like to see the CSMLS certification exam become online. If it could be written like the online self-assessment test, that would be great.

No. It's helpful to me. I think it is a good test.

It is a good development from CSMLS. It is my dream and my family's dream to live in Canada. My Canada dream will not happen if I cannot pass the CSMLS exam.

APPENDIX F – Acknowledgements

The CSMLS would like to acknowledge the assistance of these individuals and organizations.

The Foreign Credential Recognition Program of the Government of Canada

ProTraining, and its parent company, Yardstick Solutions

CSMLS Certification and Prior Learning Assessment staff

The facilitators and expert panels of the Item-Writing Workshops

Ardocs Consulting

CSMLS clients who participated in the online test, follow-up survey, and follow-up interviews