Evaluation of a health system learning program, Lean Improvement Leaders Training (LILT)

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May 24, 2016 by
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Acknowledgements

We wish to acknowledge the staff of the Health Quality Council for their guidance and expertise, and their passion for developing leadership for quality improvement in Saskatchewan health care. HQC staff provided information about the background of the program and its implementation, and feedback on the survey and interview design. They also provided the contact information for survey and interview participants. `

Lois Berry led the analysis, interpreted the findings, developed the recommendations, and completed this report. Dr. Berry contracted Horizons Strategic Consulting to assist with the design of the project and to collect the project data. She was responsible for designing the overall analytical approach and framework, in consultation with Laurence Thompson and other Horizons research staff.

Carolyn Camman, Horizons Research Associate, conducted an extensive literature review to provide background for the project, and assisted with the pilot testing of the project survey. Stephen Weiss, Horizon Research Consultant conducted interviews with the program participants, coaches and facilitators, and completed the thematic analysis of the interview data. Barb Crockford, Horizon Administrative Coordinator, scheduled interviews, provided administrative support and proofread the report. Laurence Thompson, Horizon Managing Consultant, assisted in designing the overall analytical approach and framework, analyzing the survey data and in designing and writing the Findings section of the report.

The project team would like to sincerely thank the survey and interview participants who engaged in this evaluation process. Their willingness to contribute their time, energy and insight in order to strengthen leadership training for quality improvement initiatives in Saskatchewan health care is commendable.

Summary

Introduction

The Health Quality Council (HQC) engaged Dr. Lois Berry to conduct an independent evaluation of a health system learning program, Lean Improvement Leaders Training (LILT). The program had been designed and delivered to participants in three major urban Saskatchewan regional health authorities, six regional, rural or northern regional health authorities, and seven central services/ government organizations (non-direct care agencies). The purposes of the evaluation were to better understand the process and impact of a learning program, to compare and contrast two learner delivery methods, traditional classroom and flipped classroom (an alternate pilot project delivery in one large urban health region), and to provide recommendations for necessary or desirable modification of the program.

The program consists of ten modules delivered on average about one month apart. Modules were available online for those in the flipped classroom delivery pilot. A package of teaching resources was provided for coaches and workshop facilitators.

Methods

Literature review

The literature review was based on a search of three academic databases (PubMed, CINAHL, and the Cochrane Library), the Health Canada and Saskatchewan Ministry of Health websites, and additional searches with the Google Scholar and Google search engines. A combination of keywords was used, including "lean improvement/change", "releasing time to care", "productive ward", "quality improvement/management", "leadership/management training/skills/strategies", and "evaluation/program evaluation/implementation".

Survey

The evaluator surveyed LILT program participants in early 2016 using an on-line survey tool, and linked the survey data to data on their position, organization, instructional model, and classroom type.

Interviews

All coaches / facilitators and an intentional sample of participants were interviewed by telephone. The participants were interviewed following their participation in the survey.

Review of course materials

The evaluator reviewed course materials to provide evaluative feedback to the Health Quality Council staff by reviewing the unit content against the unit objectives. The modules followed a standard format with learning objectives for each module and overall program objectives for participants. The program used self-directed and experiential learning, ongoing feedback and evaluation, self-paced learning, peer learning and support, and a continuous learning cycle.

Findings

Literature review findings

State of the research

There is no shortage of research on healthcare leadership, but one area that is not well studied is the efficacy of leadership training programs. Reasons for this include the complexity of the programs and their implementation settings, lack of resources for conducting evaluations, de-prioritization of evaluation as a program need, difficulties in designing evaluations which clearly establish links between training and outcomes, a lack of theory around which such evaluations can be organized, and a lack of general knowledge about how to effectively design and carry out evaluations

Much research focuses on short-term, individual-level outcomes, such as changes in reported knowledge and skills. Relatively few papers discuss skill transfer to the workplace or any organization-level outcomes. There is a need for more longitudinal studies and research comparing program components, such as delivery method. Cost analyses are also largely undiscussed, despite the high monetary investment in these initiatives.

Given that the implementation of Lean in healthcare is still relatively new and the focus on leadership training within Lean newer still, it is understandable that the breadth of its research base has not yet matched the scope of its implementation. This underscores, however, the need to continue to generate and disseminate evaluative findings on the outcomes of Lean and its leadership training components.

Recent trends and research findings

There is some evidence for the potential effectiveness of leadership training programs although much of the evidence on training program efficacy has relied on limited qualitative and self-reported evidence. Without a broader body of literature to draw upon, it is difficult to draw firm conclusions about the overall efficacy of leadership training, particularly with regard to outcomes beyond improvements in leadership skills. The literature review shows that it is also challenging to identify whether particular program elements, such as mode of delivery, affect program efficacy.

Evaluating leadership development

One reason for the inadequate state of leadership training evaluation is the lack of an effective evaluation framework. An effective model must incorporate recognition of different types of outcomes (skills and attitudes, behaviours and performance, and patient health outcomes), the different levels at which these outcomes can occur (individual, organizational, and systemic), and the situational factors which can influence outcomes. One evaluation framework is the Kirkpatrick learning evaluation model. The Kirkpatrick model is a continuum of outcomes over four levels: reaction to learning, learning gain, behaviour change, and business results.

Participants input

Feedback was received from the participants via 170 completed surveys and from 16 participants who agreed to participate in follow-up interviews.

Survey of program participants

The response rate to the survey was 60 per cent. Response rates did not significantly vary by position, organization type, or classroom type (traditional or flipped). Ninety-two percent of survey respondents reported they had started the LILT program. Only those who responded that they had started the LILT program responded to further questions.

Only the first four modules (of ten) had been completed by more than half of participants at the time of the survey. Seven per cent of participants had also completed another local module that was not part of the general program.

Participants were asked to indicate their response to various statements about the LILT program. All ratings were positive. The strongest positive rating was for support from a supervisor to participate in LILT. The weakest positive rating, essentially neutral, was that the participant had time to participate in the LILT program.

Participants in the three largest urban RHAs reported that the LILT program was easier to use and the quality of materials was higher than those in other regional health authorities or in central or government organizations. Participants in the flipped classroom model rated ease of use of the LILT program, quality of materials, and applicability of the materials to their work higher than those in a traditional program. No other associations were statistically significant.

The flipped classroom approach was piloted by a large urban health region, and, as such, had no comparative data from smaller regional organizations or central service/government organizations.

Participants who provided negative ratings on the survey questions were asked to provide an explanation of their responses. For ease of access to LILT materials, negative ratings were because materials were not provided in a timely manner, or participants had difficulty finding materials. For ease of use of the LILT learning program, negative ratings were because the program was repetitive and too low a level for adult learners, assignments were unclear, confusing or not relevant to work, and forms were cumbersome, confusing or not appropriate for work outside of health care. Negative ratings on support from a supervisor to participate in LILT were because a supervisor did not provide relief from daily work to work on LILT. The statement on time to participate in the LILT program drew the most negative response to the LILT program with 60 respondents (34 per cent) disagreeing that they had had time to participate. Almost all respondents who gave negative ratings on time to participate, reported they had to complete LILT work on their own time, or try to fit it in with other work, or do other work at night or on weekends. For those that gave negative ratings on quality of the materials, reasons included that some materials were too complex and difficult to understand and that materials, were at too low a level for an adult learner. For applicability of materials to work, the explanation was that the materials were geared to acute patient care or manufacturing and not appropriate for their settings.

Respondents reported the three modules most applicable to their work (after weighting for number of modules completed) were:

- Optimizing flow - Improving Flow and Reducing Waste;
- Zero defects - Mistake Proofing and Patient Safety; and
- Supporting change - PDCA, Standard Work / Work Standards and Replication.

The main reasons why respondents made the choices they did for the most useful modules were that the modules provided practical, relevant methods and useful tools for organizing the work and testing new ideas, were applicable day-to-day, and that visualization tools improved team communication, clarified processes, helped focus on changes needed, and showed how everything fits together.

Respondents reported the most important things learned from participating in LILT were a better understanding of Lean tools and concepts, how their work fits into a larger picture, and how to use the tools; to engage staff in a team to make and support changes; and how to use specific Lean tools.

Asked one thing in their work they had changed as a result of LILT, respondents' top themes were: using visual management, a general effort or new perspective, other specific changes, and more and better communication with staff / co-workers.

Asked to rate their agreement with five statements about the results of their participation in LILT, respondents agreed they could use Lean methodology to identify key improvement opportunities for staff and patient experience; improve safety and quality, optimize flow and reduce waste; use data to understand the current state, guide improvement of work, and monitor progress; demonstrate Lean Leader behaviours as part of daily practice; and engage in self-reflection and set goals for development as a Lean Improvement leader.

Asked the one most important thing LILT did well, that it should keep doing, the top themes were practical learning activities; excellent coaching; collaborative, interactive sessions; engaging staff at all levels in a culture of improvement; and teaching specific skills. Asked what would make LILT even better, respondents' themes were fragmented. The top four themes, accounting for fewer than half of the responses, were detailed or specific changes, addressing the time pressures, participant pairs or teams to work together on a local improvement project, and better instructors / instruction.

Many of the proposed changes were contradictory to other proposed changes. For example, some respondents proposed less instruction time and recognition of prior learning, while others asked for longer sessions and extended training. What drew together the majority of the responses was the desire to address the stress and time pressures of the training.

Asked for general comments, respondents said LILT was a great training opportunity, had specific miscellaneous critical comments, said LILT was a lot of work on top of regular work, and said that there was great coaching and support.

Asked what had worked well about the process of delivering LILT, participants like the model of working with their colleagues to identify issues and possible solutions, enjoyed the time to work with others in their region and workplaces to talk about common issues and to develop networks, and liked the teaching method that allowed class time to be limited and focused on group interaction.

Participants identified many specific suggestions for improvements although some were contradictory. Some participants said the examples used in the course required improvement, but some wanted more specific examples, while others wanted more generic examples.

Asked how they had changed their work as a result of participating in LILT, participants generally agreed that their work practices had changed since taking the course. Examples were the increased use of visual tools, an increase in regular meetings with staff, an increase in the use of Lean tools, and the use of data collection to guide analysis and planning.

Asked about specific changes, most participants reported an increase in behaviours meeting all of the program goals with the exception of participating in networks of Lean improvement leaders. Most participants reported and gave examples of how they

- Use visual management tools / methods for daily continuous improvement;
- Implement tools and methods to improve safety, optimize flow and reduce waste;
- Use data to understand, monitor and sustain unit / area progress;
- Facilitate and engage staff in identifying, testing and implementing improvement ideas, and coach and mentor staff in using Lean tools; and
- Engage in self-reflection and set goals for development as a Lean Improvement leader.

Asked if they participate in any networks of Lean improvement leaders outside their organization, however, all answered no.

Asked what LILT does well, participants identified three things:

- Continue the model of providing training in manageable pieces in the context of their own workplace;
- Wider training of staff on Lean tools and techniques; and
- Development of networks and relationships between different units and responsibility levels of staff.

Respondents said what would make LILT even better was a variety of specific suggestions to improve the program.

In other general comments, respondents said that LILT is a good program, that they liked Lean and the material, that the coaching was excellent, and that they liked the monthly spacing of modules.

Coaches / mentors and facilitators' input

Coaches/ mentors and facilitators were not surveyed but participated in telephone interviews. The coaches / mentors and facilitators reported multiple roles in implementing LILT, with the most common being to both teach the modules and oversee and implement the program.

Coaches/ mentors and facilitators reported they had worked with a total of 283 participants, ranging from 7 to 73 participants each.

Those interviewed said the model of teaching and learning in their own workplace with colleagues was the most highly rated quality of the LILT program. The manageable pace of the program (one program per month) also ranked highly on the list of positive qualities.

They reported they had the support they needed from leadership and colleagues in their organization. All coaches/ mentors and facilitators interviewed agreed their role was clear to them, and all reported they felt confident in their capacity to deliver the content.

Asked for suggestions to improve LILT those interviewed said ensuring strong Lean mentors, having more time to complete modules, providing guidance and examples of student projects, and a province-wide system to train the trainers were the most important improvements that could be made.

Asked if they had noticed any change in attitude in those participating in LILT, most coaches/ mentors and facilitators answered yes, that participants were happy to learn the new skills and to finally understand the language and terminology of Lean.

Asked if they had noticed any changes in how LILT participants do their work, some answered yes, and a few noted that they are beginning to see changes.

The changes in participants' work noticed by coaches/ mentors and facilitators included demonstrating understanding of tools and concepts, use of Lean tools, improved initiative, and confidence to discuss Lean concepts and improvement ideas.

Coaches/ mentors and facilitators reported that, as a result of participating in LILT, participants they had observed now use Lean methodology to identify key improvement opportunities; improve safety and quality, optimize flow and reduce waste; demonstrate Lean leader behaviors as part of daily practice. About half of coaches reported that they saw participants now use data to understand the current state, guide improvement work, and monitor progress; and engage in self-reflection and set goals for development as a Lean Improvement leader.

Asked if they have seen participants in their organizations participate in networks of Lean improvement leaders outside their organizations, none of those interviewed had heard of this.

Coaches/ mentors and facilitators were asked to identify the one most important thing that LILT does well. They identified the following: teaching Lean, teamwork, staff engagement, and developing a shared culture of improvement language and concepts; and the applied method of teaching. There were many specific suggestions for what would make LILT better, but no strong themes.

Asked for anything else they would like to say about their experience with LILT, coaches said it covers a lot of information in a manageable way, it is a good program, they were happy to teach it, that internally they must use their resources to support and tweak it, and that it had improved staff morale and engagement around Lean and quality improvement.

Review of course materials

Course content was reviewed in relation to course objectives. The ten modules reviewed did an excellent job of addressing the course objectives. They were well organized, followed a consistent format, included examples to demonstrate concepts learned, and assignments to apply course concepts and utilize the tools provided in their own workplaces. Examples provided generally did an excellent job of demonstrating the concepts learned. Modules were in some cases uneven in their expectations, with some introducing a number of complex concepts, and others applying fewer, less complex concepts.

Discussion

In addressing the findings of the evaluation process, the following themes emerged:

Early indication of success

The evaluation data shows that the participants and leaders (coaches/mentors and facilitators) were generally very pleased with the content and processes surrounding the program. The content review of the program found that the content and approaches met the stated objectives. However, this indication of success must be viewed cautiously, given that only the first four modules had been completed by more than half of participants at the time of the survey.

A diverse group of learners with diverse needs

The evaluation process revealed divergent views in participant response to some questions. Some participants found the content too basic, while others found it challenging. Others reported that the examples were highly relevant, while others found them not relevant at all. These divergent responses are representative of the diverse groups included among the participant group. LILT has done a good job of attempting to address the needs of these diverse groups, but clearly, this will be an ongoing project.

Support from supervisor a key requirement for success

The strongest positive agreement about the program from each of its participants was with respect to the support to participate provided to them from their supervisor. This illustrates the importance of such support to the success of LILT in the long term.

Importance of participant engagement with Lean

Survey and interview data of both participants and leaders indicated that engaging learners with Lean was a major part of the success of the program. This engagement appears to not only have increased their understanding of Lean, but for some, their excitement and support of it.

Importance of networking

Participants found the networking with other participants, and others from their region, a vital part of the success of the program. It should be noted however, that the program goal of "development of networks and relationships between different units and responsibility levels of staff" was not reported as met by either participants or leaders.

Unevenness in continuity and flow

The reviewer found an unevenness in the volume and depth of content in the modules, with some having considerably more complex content and resources than others. This is not unusual in a new program, and minor tweaking will improve continuity and flow as the program evolves.

Measuring sustained behavior change and impact on quality

Participants and leaders both reported seeing behavior change in practice in relation to implementation of the course concepts and tools. While participants involved in this evaluation process reported behavioral change in themselves and/or others in the workplace as a result of the program, it is necessary to validate the existence of these changes, and to continue the evaluation process to see that such behaviors are sustained over time. It is also important to evaluate the success of such educational programs in relation to the ongoing organizational context. In the longer term, it is important to link and compare the educational program outcomes with the overall Lean quality improvement indicators that the program is intended to impact.

Support for flipped classroom approach

Participants in the flipped classroom model rated ease of use of the LILT program, quality of materials, and applicability of the materials to their work higher than those in a traditional program. The positive validation of this delivery method supports its inclusion as a valuable learning option.

Support for the applied nature of the program

There was consistent support for the applied nature of the program. The general view was that the content was highly relevant and the assignments valuable. The feedback about the applicability of the program was highly positive.

Support for time requirement a significant issue

The most consistent finding throughout this study related to the amount of time required to participate in the program, and the lack of appropriate support to accommodate this time. Even in situations where individuals were given time off to complete program work, there was no backfill provided for them in their regular positions, which meant that their work awaited them when they returned. This poses a significant challenge to the sustained success of the program over time.

Conclusion and recommendations

In conclusion, the initial data indicates that the program is meeting its intended objectives in a well-organized, relevant manner that is well received by the participants and those involved in the leadership and implementation of the program. The following recommendations arose from the themes identified during the evaluation process.

Develop an ongoing evaluation plan that addresses sustained change and outcomes related to quality improvement

There needs to be follow up evaluation with the current cohort of participants, given that less than half of those surveyed had completed more than four of the ten modules. This evaluation should be part of a comprehensive, ongoing evaluation process that looks not only at self-reported attitudes toward the program and the learning involved, but measures the sustainability of behavior change on an ongoing basis.

Expand networking opportunities within the program

LILT program planners should ensure that existing opportunities for networking are retained and enhanced, and that opportunities for engagement beyond one's own unit and with staff at different administrative levels within the organization are maximized.

Support flipped classroom initiatives

Given the very positive feedback from participants with respect to the flipped classroom pilot project, LILT program staff should feel comfortable in providing this option to regional health authorities wishing to use it in the future, with continued comparison of evaluative data of participants in the flipped and traditional classroom approaches.

Work with regional health authorities to ensure ongoing supervisor support

Given the importance placed by participants in this evaluation project on the ongoing support of their supervisors, it is essential that the HQC staff continue to work with RHA administrators to ensure that supervisors understand the importance of their support to the success of the participants. Supervisors need to be clear regarding how best to support the participants in order to maximize benefit to the LILT participants.

Continue to enhance the applied nature of the program, with specific focus on the needs of the diverse groups involved

As the program continues to develop, more Saskatchewan based examples from each of the diverse workplace types will strengthen the relevance and effectiveness of its application for participants.

Address continuity and evenness of expectations between program modules

As the program continues to evolve, minor tweaking of the content and resources available in each module in order to make them more comparable in complexity and workload will result in more similar expectations between modules.

Ensure more support for participant time to engage in the program

The most concerning finding in the evaluation project was the consistency and frequency of unease with the lack of time provided in the workplace to for participants to participate in the program. The concern was with respect to the lack of time provided by the health authorities for the participants to attend classes and workshops, prepare the necessary material and complete the assignments. Even for those who were provided time in lieu of work to engage in all aspects of the course, the frequent concern raised was that their regular work awaited them when they returned. These time constraints for participants have the potential to seriously impact the success of the LILT program in the long term.

Introduction

Saskatchewan is one of three Canadian provinces that have mandated the use of Lean methodologies in all regional health authorities, the other two being New Brunswick and Manitoba (Goodridge et al, 2015). Billed as the largest Lean experiment in the world, the province has, since 2011, made significant investments province wide, with the aim of creating a unified approach that will produce " better health, better value, better care and better teams" (Goodridge et al., 2015; Government of Saskatchewan, 2013). Working closely with a network of stakeholders, the Saskatchewan Health Quality Council (HQC) supports the training of those working in health care in continuous improvement methods and tools, including Lean. HQC also collaborates with system partners to report on the impact of improvement activity occurring within the province and creates opportunities for shared learning and spread of improvement to similar settings. Important aspects of the implementation of Lean include developing infrastructure and leadership capacity to sustain continuous quality improvement (Saskatchewan Health Quality Council, 2014).

The Health Quality Council (HQC) developed its Lean Improvement Leaders Training (LILT) as an applied learning program to "develop improvement leaders who manage and direct care, services and processes, and help them learn to use Lean tools and philosophies in their areas" (LILT Program Overview). The program overview cites the following program goals:

By the end of the program, learners will be able to:

- Use Lean methodology to identify key improvement opportunities for staff and patient experience.
- Improve safety and quality, optimize flow and reduce waste.
- Use data to understand current state, guide improvement work, and monitor and sustain unit/area progress, while maintaining focus on patient/client needs.
- Engage in self-reflection and set goals for development as an improvement leader.
- Demonstrate Lean leader behaviours as part of daily practice (such as using Lean tools and approaches to understand and improve processes, developing team members in problem solving, and modeling a culture of patient safety and continuous improvement)

The program was designed to be delivered in a cohort model in a traditional classroom setting. One regional health authority chose to deliver a pilot program using a flipped classroom approach, where participants worked through written modules prior to coming together in a workshop. Program participant categories included managers, employees and others. The principles guiding the program include self-directed learning, experiential learning, ongoing feedback and evaluation, self-paced learning, peer learning and support, and a continuous learning cycle (LILT Program Overview).

In 2014, the program was delivered to three major groups: three large urban regional health authorities (including Five Hills, Regina Qu'Appelle, and Prince Albert Parkland); six regional, rural or northern health authorities (including Cypress, Kelsey Trail, Mamawetan Churchill River, Prairie North, Sun Country and Sunrise); and several central service /government organizations (including 3sHealth, e-Health, Ministry of Health and the Saskatchewan Cancer Agency). In addition, individuals from some smaller agencies such as Health Quality Council Saskdocs and STARS joined other organizational offerings of the program.

In November 2015, the Health Quality Council engaged Dr. Lois Berry as an evaluation consultant to conduct an independent evaluation of its health system learning program, Lean Improvement Leaders Training (LILT). The purposes of the evaluation set out by HQC were to:

- Better understand the process and impact of a learning program, specifically targeting front-line health care leaders (managers, clinical nurse educators);

- Compare and contrast two learner delivery methods (traditional classroom and flipped classroom); and
- Provide recommendations for necessary or desirable modification of the program.

Horizon Strategic Consultants worked under Dr. Berry's direction to conduct the survey of LILT participants and interviews with LILT coaches and mentors. The data for the evaluation was collected in January/February 2016, with the final report submitted April 15, 2016.

Methods

The following Methods section describes the methods used in conducting a review of the relevant background literature, as well as in administering a survey to LILT participants, interviewing coaches/ mentors and facilitators, and administering follow-up interviews to a select group of the participants who completed the survey. Methods used in conducting and evaluation of course materials are also outlined.

Literature review methods

The literature review was based on a search of three academic databases (PubMed, CINAHL, and the Cochrane Library), the Health Canada and Saskatchewan Ministry of Health websites, and additional searches with the Google Scholar and Google search engines. A combination of keywords was used, including "lean improvement/change", "releasing time to care", "productive ward", "quality improvement/management", "leadership/management training/skills/strategies", and "evaluation/program evaluation/implementation".

The search produced more than 600 returns (including duplicates), which were screened for relevance and availability, producing 63 results. A follow-up search for additional research on teaching and training methods and the use of the flipped classroom in particular was conducted through the Proquest Education, Proquest Public Health, PsycInfo and PubMed databases, using the keywords "flipped classroom", "workplace training", "professional development", and "continuing education". This search identified an additional 2 results. A further 11 articles were identified through reference list searches, for a total of 76 relevant and accessible documents.

The majority of these articles were from peer-reviewed publications (49; 64%), with the remainder being technical reports, unpublished master's theses, books, and government documents. The literature review itself contained citations from more than half the identified articles (44; 58%), of which the majority were from peer-reviewed publications (36; 82%).

Survey methods

The Health Quality Council (HQC) provided a list of LILT program participants and their work email addresses after having first notified them of the evaluation survey and asking them to contact HQC to have their name removed from the list to be provided by the evaluator if they did not wish to be contacted by the evaluator.

Table 1. Definitions of instructional models

Model description	Operational definition
No known modifications	HQC was not aware of any modifications to the program by delivering organizations that might impact evaluation results. Any changes that have been made are within the scope of customization options.
Modified flipped classroom	The organization has accessed the online materials and joined via Telehealth for learning sessions.
Some enhanced content	The organization has added supplemental modules or materials to the core content.
Minor modifications to flow / order	The organization has changed the recommended order of modules.
Traditional classroom	The organization has offered learning primarily using a workshop structure.
Flipped classroom	The organization has provided online modules prior to the workshop content.

HQC provided a list with the position, organization, instructional model (described in Table 1) and classroom type for each participant. With the survey respondents' knowledge, these data were linked to survey responses received. This linkage allowed for participant responses to be compared using position, organization and classroom type variables.

On-line web-based surveys were distributed by email on January 13, 2016, using the QuestionPro survey system, followed by two reminders at weekly intervals. The survey was closed on February 3, 2016.

Analysis was carried as reported in the Findings. Open-ended questions were themed by one member of the evaluation team, and then a sample verified by the lead evaluator.

Interview method

Interviews were conducted with two groups: coaches/mentors and facilitators, and LILT participants who had indicated a willingness to be interviewed when completing the survey.

Coaches / mentors and facilitators

Coaches/ mentors and facilitators who agreed were interviewed in scheduled telephone interviews using the interview guide attached in Appendix 2. Responses were recorded as interview notes.

Participants

From participants who were asked when surveyed if they would be willing to be interviewed by telephone, the following samples of participants were selected for interviews:

- Randomly selected pilot study respondents to provide a small representative sample for the interviews;
- Participants who gave the most strongly disagreeing responses on Question 8, "I have found the materials applicable to my work".
- Participants who gave the most strongly agreeing responses to the same question.

These two latter samples provided sample of a range of opinions for the interviews. Interviews were conducted by telephone using the interview guide attached in Appendix 2.

Review of course materials

The reviewer (Dr. Berry) conducted a review of course materials to provide evaluative feedback to the Health Quality Council staff. Following a brief overview of the literature with respect to current best practices in such program reviews, the reviewer consulted with Dr. Sheryl Mills from the Gwenna Moss Teaching and Learning Center at the University of Saskatchewan regarding current evaluation practices recommended at the Center. Based on discussions with Dr. Mills, the evaluation framework agreed upon was a simple process of reviewing the unit content against the unit objectives to determine whether the content provided positioned students to meet the learning objectives of the unit.

HQC staff provided the researcher with access to a series of modules that had been developed for independent study by students in the flipped classroom delivery mode of the program, as well as course materials such as PowerPoint slides that were provided to course facilitators. Facilitators were allowed / encouraged to modify the slides for delivery of the program to their participants. Given that there was no guarantee that the content delivered in the traditional delivery mode would be provided consistently to all participants, the reviewer opted to review the online modules as the most consistent and comprehensive way of assessing the content in relation to program objectives.

Findings

This section of the report outlines the findings of the review of the literature, as well as the evaluation project findings. The evaluation project findings are reviewed in relation to the feedback from both participants and the course facilitators. Feedback was received from the participants via survey (170 completed surveys), and from 16 of the participants who agreed to participate in follow-up interviews. Facilitator and coach/mentor feedback was provided via interviews (11interviewees). The results are reported below in relation to responses to survey and interview questions from the participant and facilitator groups. The findings of the review of course materials are included at the end of this section.

Literature review

State of the research

There is no shortage of research on healthcare leadership (Steed, 2012). However, one area that is not well studied is the efficacy of leadership training programs (Boaden, 2006; West et al., 2015; White et al., 2014). This is not unique to healthcare, as many transformative leadership programs are not well evaluated (Reinelt, Foster, & Sullivan, 2002). It is also not unique to leadership development, as many on-the-job training programs in healthcare are also understudied (O'Malley, Perdue, & Petracca, 2013). Reasons for this include the complexity of the programs and their implementation settings, lack of resources for conducting evaluations, de-prioritization of evaluation as a program need, difficulties in designing evaluations which clearly establish links between training and outcomes, a lack of theory around which such evaluations can be organized, and a lack of general knowledge about how to effectively design and carry out evaluations (Humphris et al., 2004; O'Malley et al., 2013; Reinelt et al., 2002).

Many recent reviews of the effects of leadership training programs across different areas of healthcare report that there are few evaluation studies available (Blumenthal et al., 2014; Harvath et al., 2008; Humphris et al., 2004; Kilty, 2005; Mahon, Bartlett, Dickinson, & Glanville, 2015; Rosenman et al., 2014; Steed, 2012; West et al., 2015) or that the available research is of weak methodological quality (Harvath et al., 2008; Mahon et al., 2015; Rosenman et al., 2014). The same challenge was encountered in the preparation of the present literature review.

Much research focuses on short-term, individual-level outcomes, such as changes in reported knowledge and skills. Relatively few papers discuss skill transfer to the workplace or any organization-level outcomes (Pegram, Grainger, Sigsworth, & While., 2014; West et al., 2015). There is also a need for more longitudinal studies and research comparing program components, such as delivery method (Humphris et al., 2004). Cost analyses are also largely undiscussed, despite the high monetary investment in these initiatives (Harvath et al., 2008; White et al., 2014).

Given that the implementation of Lean in healthcare is still relatively new and the focus on leadership training within Lean newer still, it is somewhat understandable that the breadth of its research base has not yet matched the scope of its implementation. It underscores, however, the need to continue to generate and disseminate evaluative findings on the outcomes of Lean and its leadership training components.

Recent trends and research

Efficacy of training programs

Although more research is needed, there is some evidence for the potential effectiveness of leadership training programs (Mahon et al., 2015; West et al., 2015). One experimental study found that clinical managers participating in leadership training within a Lean context saw significant sustained increases in the quality of the leadership skills as perceived by their staff, whereas the scores in the control group rose and then returned to baseline over the 12-month measurement

period (Frumenti & Kurtz, 2014). Clinical outcomes were also reported, but showed comparable sustained improvements for both the intervention and control groups, possibly due to a methodological confound. Thus there is evidence that the program effectively teaches leadership skills, but it does not unequivocally confirm the link to clinical outcomes.

Another recent study employing randomized control trial methods in a double-blind experiment also found that staff assessments of managers' leadership skills significantly improved compared to baseline as well as to the control group that received no training (Jeon et al., 2015). These improvements were sustained over an 18-month period, including 6 months after the intervention ended. The intervention program was Clinical Leadership in Aged Care (CLiAC), which is not explicitly related to Lean, but has comparable goals of promoting effective, patient-centered care. However, it should be noted that the intervention was not found to reduce staff turnover or improve patient safety or quality of care.

The other available studies of training program efficacy have relied on largely qualitative and self-reported evidence that participants feel their leadership skills and competencies have been positively affected by participation in the program (e.g., Aji et al., 2013; Blumenthal et al., 2014; Cadmus & Holmes, 2013; Clarke et al., 2012; Fernandez, Noble, Jensen, & Steffen, 2015). Without a broader body of literature to draw upon, it is difficult to draw firm conclusions about the overall efficacy of leadership training, particularly with regard to outcomes beyond improvements in leadership skills.

Given the lack of high quality evaluations in this area, it is also challenging to identify whether particular program elements, such as mode of delivery, affect program efficacy (Rosenman et al., 2014). Many delivery methods and tools have been used in the delivery of programs such as these, including lectures, workshops, simulations, mentoring, coaching, and special leadership assessments (West et al., 2015). Interventions frequently employ more than one method (Rosenman et al., 2014). Some authors advocate for the use of 'action learning' techniques, which typically involve more self-directed teaching and sometimes small group learning (Boaden, 2006; Humphris et al., 2004), although the research evidence to support the utility of this was not clear (West et al., 2015). One study reported no difference regardless of whether training occurred online or in the classroom (Mahon et al., 2015).

Evaluating leadership development

Frameworks

One study addressing the lack of research on training outcomes in healthcare identified that one reason is the lack of an effective framework around which such evaluations can be structured (O'Malley et al., 2013). The authors of this study determined that an effective model must incorporate recognition of different types of outcomes (e.g., skills and attitudes, behaviours and performance, and patient health outcomes) as well as the different levels at which these outcomes can occur (e.g., individual, organizational, and systemic) and the situational factors which can influence outcomes at every level, including the even broader environmental level (e.g., external political factors). They subsequently developed a comprehensive model which incorporates all of these elements.

Another evaluation framework, originally developed for education and subsequently adapted to healthcare, is the Kirkpatrick learning evaluation model (Kirkpatrick & Kirkpatrick, 2006). This model was referenced by several researchers in developing evaluations for various interventions (Boaden, 2006; Blumenthal et al., 2014; Fernandez et al., 2015; Humpris et al., 2004; Testani et al., 2014) as well as organizing literature reviews (Rosenman et al., 2014). The utility of the Kirkpatrick model is in establishing a continuum of outcomes over four levels, as follows (based on the healthcare adaptation in Testani et al., 2014):

Level 1: Reaction to learning. Outcomes at this level refer to how the participants responded to the training, not only with respect to global satisfaction but satisfaction with specific elements (e.g., instructor effectiveness, teaching methods). Participants who reported positive outcomes at Level 1 are more likely to report gains at Levels 2 and 3.

Level 2: Learning gain. This level includes changes in participants' knowledge, skills, and attitudes. This requires that specific learning objectives and desired outcomes be defined prior to the implementation of training, and assessment should again occur immediately after. The types of learning outcomes can range from the relatively simple (new acquired information) to the complex (the ability to analyze, critique, and synthesize new information and ideas based on what has been learned).

Level 3: Behaviour change. These outcomes refer to the application of what has been learned to the workplace setting. When outcomes at Levels 1 and 2 are positive, this supports but does not guarantee favourable outcomes at Level 3 as there are additional factors which impact skill transfer, such as the supportiveness of the organizational culture and the presence of sufficient resources and rewards for change, not unlike the facilitators and challenges to leadership discussed above.

Level 4: Business results. Moving beyond changes in individuals, outcomes at this level represent changes occurring at the organizational/systemic level, including clinical outcomes and any indicators of improved organizational functioning (e.g., reduced staff turnover, higher productivity, cost savings).

It is evident from the research that many of the outcome studies have focused primarily on Level 1 and Level 2 outcomes and that Level 3 and 4 outcomes are under-represented in the literature so far. It is also possible that the failure of some programs which demonstrated clear learning gains at Level 2 to translate into effective Level 3 and 4 outcomes points to some unaddressed barriers to knowledge and skills transfer for all the desired outcomes to be realized.

Participant input

Survey

Overall response

HQC provided 330 usable names of LILT participants. All were reached with the emailed survey. (There were no returned emails.) Of all participants, 320 were eligible (available, not on leave). Of the eligible participants 208 responded to the survey by completing Question 1, asking if they had started the LILT program. Of Question 1 respondents, 92 per cent reported they had started LILT, however, eight per cent of this 92 per cent answered no further questions in the survey. These eight per cent were not counted as survey respondents.

Therefore, we counted 192 participants (60 per cent of those eligible) as respondents to the survey. Of respondents who had started LILT and who started providing data in the survey, 170 (96 per cent) fully completed the survey (Table 2).

Table 2. Response analysis of baseline survey

	Response measure	Count	Calculation	Percentage
A.	Total LILT participants (334 names on list)	334		
	Less names without email addresses	(4)		
B.	Total surveys distributed	330		
C.	Reached participants (valid email address) **(Reach percentage)**	330	C / B	**100%**
	Less unavailable: - on vacation or leave - retired, or withdrawn from or not involved in LILT	 (6) (4)		
D.	Available respondents **(Eligible for survey)**	320		
E.	Completed Q1, "Started LILT?") **(Survey start percentage)**	207	E / D	**65%**
F.	Reported that they had started LILT (on Q1) **(Percentage started program)**	192	F / E	**92%**
G.	Less those that responded to Q1 that they had started LILT, but responded to no further questions	(16)		
H.	Responded to Q1 AND, if response was that they had started LILT, responded to any further questions **(Survey response percentage)**	191	H / D	**60%**
I.	Responded that they had started LILT, and responded to any further questions **(Started providing survey data about participation)**	176		
J.	Completed survey after starting to provide data (completed at least one of Q12) **(Survey completion percentage)**	170	J / I	**96%**

Determinants of response

Response rates did not significantly vary by Position (manager, employee, or other), Organization type (major urban RHA; regional, rural or northern RHA; or central services / government), or Classroom (traditional or flipped) (Table 3).

Table 3. Response of eligible participants by selected characteristics

Selected characteristic	Count		Percentage		Significance (2)
	Total	Responding (1)	of all participants who were in category	responding within each category	
Overall response	**320**	**176**		**65**	
Response by Position Type			**100**		ns
Manager	178	111	56	62	
Employee	117	63	37	54	
Other	25	17	8	68	
Response by Organization Type			**100**		ns
Major urban RHA)	92	59	30	64	
Regional / rural / northern RHA	131	74	41	56	
Central services or government	97	58	29	60	
Response by Classroom Type (3)			**100**		ns
Traditional	261	153	82	59	
Flipped	58	38	18	66	

1. Participants were categorized as responding if they answered to Q1 that they had not yet started LILT, OR if they answered that they had started LILT AND answered any further questions.
2. Significance in a Chi-squared test at $p \leq 0.05$; ns: not significant

Q1. Started LILT program

Ninety-two percent of survey respondents reported they had started the LILT program. Only those who responded that they had started the LILT program responded to further questions.

Q2. Modules

Respondents reported the last module they had completed (Table 4). Only the first four modules had been completed by more than half of participants at the time of the survey. Seven per cent of participants (12) had completed another local module that was not part of the general program.

Local modules added and the number of participants reporting included:

- Lean / change leadership (5);
- A3 thinking (4);
- Driver diagramming (2);
- Root cause analysis (2);
- Rapid Process Improvement Workshop (RPIW); and
- Kaizen planning.

Table 4. Modules completed

	Module	% of participants who had completed module
1	Using visual management - Daily Visual Management	99%
2	Managing supplies - 5S and Kanban Ready	93%
3	Understanding your current state - Value Stream Mapping: Part 1	80%
4	Improving your future state - Value Stream Mapping: Part 2	69%
5	Supporting Kaizen events - Kaizen Event Process and Sustaining Improvement	47%
6	Supporting change - PDCA, Standard Work / Work Standards and Replication	40%
7	Creating a visual workplace - Visual Control and Visual Management	29%
8	Optimizing flow - Improving Flow and Reducing Waste	10%
9	Zero defects - Mistake Proofing and Patient Safety	9%
10	Reflections on learning Lean - Capstone presentation	7%
	Other module(s) as part of a region or organization's local program	7%

Q3 – Q8. Program ratings and comments

Ratings

Participants were asked to indicate their response to various statements about the LILT program on a five-point scale, where -2 was strongly disagree and +2 was strongly agree. A positive rating is therefore any rating from more than zero to two, and a negative rating is one from less than zero to minus 2 (Table 5). All ratings were positive. The strongest positive agreement was that the participant had support from a supervisor to participate in LILT. The weakest positive agreement, essentially neutral, was that the participant had time to participate in the LILT program.

Table 5. Program ratings

Q	Rating statement	Agreement (-2 to +2)
3.	I have been easily able to access the Lean Improvement Leadership Training (LILT) materials.	1.1
4.	I have found it easy to use the LILT learning program (materials, assignments, and feedback).	0.7
5.	I had support from my supervisor to participate in LILT.	1.4
6.	I have had time to participate in the LILT program.	0.1
7.	The materials were of good quality.	0.9
8.	I have found the materials applicable to my work.	0.8

n = 163-176

Association of rating statements responses with selected participant of program characteristics

Rated statement responses were tested to see if they were statistically associated with:

- Respondent position (manager, employee, or other);
- Respondent organization type (urban RHA (the four largest); regional, rural or northern RHA; or central services / government); or
- Classroom type in which the participant was involved (traditional or flipped) (Table 6).

Participants in the four large urban RHAs reported that the LILT program was easier to use and the quality of materials was higher than those in other regional health authorities or in central or government organizations. Participants in the flipped classroom model rates ease of use of the LILT

program, quality of materials, and applicability of the materials to their work higher than those in a traditional program. No other associations were statistically significant.

Since the flipped classroom pilot project was conducted in one large urban regional health authority, it is not surprising that 90% of the participants were from urban RHAs, and none were from central or government organizations (data not shown in tables).

Table 6. Program ratings (1) by sub groups (2)

(Only significant differences by subgroup are shown (3).)

		Subgroup (2)							
		Position			Organization			Classroom	
Q	Rating statement	E	M	O	U	R	C	F	T
3	Ease of access to materials								
4	Ease of use of the LILT program				1.1	0.6	0.5	1.2	0.6
5	Support from supervisor to participate								
6	Time to participate								
7	Quality of materials				1.3	0.8	0.6	1.3	0.7
8	Materials applicable to work							1.3	0.6

1. Program ratings from -2, Strongly disagree, to +2, Strongly agree. For full statements rated, see Table 5
2. Position: **E**mployee / **M**anager / **O**ther
   Organization: **U**rban RHA (four largest RHAs) / **R**egional, rural or northern RHA / **C**entral services or government
   Classroom in which the participant was involved: **F**lipped / **T**raditional
3. Chi-squared test statistic, $p \leq 0.05$.

Areas for improvement

Participants who had disagreed with any of the above rating statements (a -2 or -1 response) were asked to provide an explanation. Numbers in parentheses indicate how many respondents provided a comment within that theme.

Q3. Ease of access to LILT materials

The 17 (ten per cent) negative ratings included the following themes:

- Materials were not provided in a timely manner (8);

  Participants reported that materials were posted at the last minute (the same day or the day before the session). One participant reported that materials provided did not match material used in the session.

- Participants had difficulty finding materials (6); and

  Materials were difficult to find online, and if emailed, participants reported they had to search through emails to find them. The emailed links did not work for one person.

- Two participants would have appreciated more resources or a resource list for background material.

Q4. Ease of use of the LILT learning program

The 23 (13 per cent) negative ratings included the following themes:

- The program was repetitive and too low a level for adult learners (4);
- Assignments were unclear, confusing or not relevant to work (4);
- Forms were cumbersome, confusing or not appropriate for work outside of health care (4);
- Materials were confusing (2);
- Materials were not matched to presentations (2); and

- There was insufficient explanation in written material presented as slides (2).
- Other issues mentioned by one respondent each were:

  Examples were not relevant;
  The approach was too rigid;
  The order of modules was inappropriate; and
  Feedback was not provided until too late in the process.

Q5. Support from supervisor to participate in LILT

Seven (four per cent) negative ratings included the following comments:

- Supervisor did not provide relief from daily work to work on LILT (3);
- Training was not connected to workplace processes and changes;
- Participation was not optional (2); and
- Supervisor showed little interest in the training.

Q6. Time to participate in the LILT program

This topic, rated neutral overall, drew the most negative response to the LILT program, with sixty respondents (34 per cent) disagreeing that they had had time to participate. Themes of their explanations for their negative responses included:

- Almost all respondents who gave negative ratings on time to participate reported they have had to complete LILT work on their own time, or try to fit it in with other work, or do other work at night or on weekends. For some this has caused increased stress in both work and home life. Even when given time from work to participate, some participants reported that they still faced their full workload when they returned (55).
- Training should recognize previous experience, or should be built around one major project for all modules, to save time while maintaining learning (2).
- Courses could be shortened, such as by reducing redundant discussion time (2).
- The time commitment included four hours total travel time to attend each session.

Q7. Quality of the materials

Fourteen (eight per cent) respondents disagreed that the materials were of good quality. Their reasons included:

- Some materials were too complex and difficult to understand (5).
- Materials were at too low a level for an adult learner (3).
- Material was too repetitive (2).
- Material was too generic or standardized, with not enough examples of real life use (2).

Three other points were made by one person each: more varied materials such as webinars and videos would better address different learning styles; written materials in point form with little detail did not allow a review of concepts to better understand them; and presentations did not follow the same order as the written materials.

Q8. Applicability of materials to my work

Fifteen (nine per cent) respondents disagreed that the materials were applicable to their work. Their two main explanations were:

- The materials were geared to acute patient care or manufacturing, not appropriate for other settings where there is much less control of the process (7); and
- Some tools were applicable to work while others were not (3).

Other comments made by one respondent each were that the participants struggled to apply the tools and keep them updated; the materials focussed on learning jargon and on paper work assignments, rather than being linked to real work; there was a lack of logical flow to the materials;

the multiple assigned projects made it difficult to consistently link to the participant's work; and the materials were poorly presented.

Q9. Modules most applicable to work

Rank of modules

Respondents were asked to select the three modules that were most applicable to their work (Table 7). Because fewer than half of respondents had completed any modules past Module 4, the results were weighted by the proportion of modules completed. The weighting assures all modules had an equal chance of being ranked in the top three regardless of how many participants had completed that module. The top ranked modules, after weighting, were:

- Optimizing flow - Improving Flow and Reducing Waste (ranked in the top three by a weighted 63 per cent of respondents);
- Zero defects - Mistake Proofing and Patient Safety (48 per cent); and
- Supporting change - PDCA, Standard Work / Work Standards and Replication (40 per cent).

Table 7. Ranking of modules completed

Module		No. of respondents who . . . completed module	No. of respondents who . . . ranked module in top 3	Weighted percentage ranking module in top 3 (1)
1	Using visual management - Daily Visual Management	175	119	**35%**
2	Managing supplies - 5S and Kanban Ready	164	74	**23%**
3	Understanding your current state - Value Stream Mapping: Part 1	140	81	**31%**
4	Improving your future state - Value Stream Mapping: Part 2	122	55	**27%**
5	Supporting Kaizen events - Kaizen Event Process and Sustaining Improvement	83	14	**10%**
6	Supporting change - PDCA, Standard Work / Work Standards and Replication	70	42	**40%**
7	Creating a visual workplace - Visual Control and Visual Management	51	28	**31%**
8	Optimizing flow - Improving Flow and Reducing Waste	18	16	**63%**
9	Zero defects - Mistake Proofing and Patient Safety	16	10	**48%**
10	Reflections on learning Lean - Capstone presentation	13	0	**0%**

1. Weighted by the proportion of all ten modules completed. (Respondents who had completed three or fewer modules were weighted as 0.1, as they had choices equal to the number of modules completed.)

Reasons for choice of most useful modules

Respondents were asked for reasons why they made the choices they did for the most useful modules. The top three themes of the reasons were (Table 8):

- The modules provided practical, relevant methods and useful tools for organizing the work and testing new ideas, applicable day-to-day (34 per cent);
- Visualization tools improved team communication, clarified processes, helped focus on changes needed, and showed how everything fits together (29 per cent); and
- Staff were interested and engaged in the process and happy with the result (7 per cent).

Table 8. Themes of reasons for choosing most useful modules

Themes	Count (1)	%
Practical, relevant methods and useful tools for organizing the work and testing new ideas, applicable day-to-day.	57	34%
Visualization tools improved team communication, clarified processes, helped focus on changes needed, and showed how everything fits together.	49	29%
General comments about selection process, including that the respondent has not yet completed enough modules to respond.	27	16%
Staff interested and engaged in the process and happy with the result.	12	7%
Tools have resulted in improvements in the way we work.	8	5%
Other	8	5%
Module not useful.	2	1%
Provided structure and consistency in the team's work.	2	1%
Was already using tools	2	1%
Total	**167**	**100%**

1. Up to three themes were taken from a comment; n of respondents = 131.

Q10. Most important thing learned

Respondents were asked the most important thing learned from participating in LILT. The top three themes were (Table 9):

- A better understanding of Lean tools and concepts, how my work fits into a larger picture, and how to use the tools (21 per cent);
- Engage staff in a team to make and support changes (15 per cent); and
- How to use specific Lean tools (10 per cent).

Table 9. Themes of the most important thing learned

Themes	Count (1)	%
A better understanding of Lean tools and concepts, how my work fits into a larger picture, and how to use the tools	31	21%
Engage staff in a team to make and support changes.	22	15%
How to use specific Lean tools	15	10%
The value and impact of visual management	10	7%
Constant two-way communication is very important in change processes.	8	5%
Just start doing it. Starting a change doesn't have to be perfect and can be small.	7	5%
Change does not come easily, as proposals for change can be seen as criticism of what people do now. Meeting clients' needs must be the driver of improvement.	6	4%
The need to focus on continuous improvement	6	4%
You need actual observation and documentation of facts to understand processes and make changes.	5	3%
Other	14	10%
Can't answer yet, as have taken too few modules	5	3%
Response not relevant to this question	17	12%
Total	**146**	**100%**

1. n of respondents = 146.

Q11. One thing in my work I have changed as a result of LILT

Respondents were asked one thing in their work they had changed as a result of LILT (Table 10). The top four themes were:

- Using visual management (27 per cent);
- General effort or new perspective, not specific (21 per cent);
- Other specific change (12 per cent); and
- More and better communication with staff / co-workers (11 per cent).

Table 10. Themes of one thing in my work I have changed as a result of LILT

Themes	Count (1)	%
Using visual management	41	27%
General effort or new perspective, not specific	32	21%
Other specific change	18	12%
More and better communication with staff / co-workers	17	11%
No change	11	7%
5Sed workspace or storage	9	6%
More intentional / structured in organizing and measuring in implementing improvement work	9	6%
Implemented standard work	5	3%
Response not relevant to this question	4	3%
Too early to say	4	3%
Total	**150**	**100%**

1. n of respondents = 150.

Q12. Results of participating in LILT

Respondents were asked to rate their agreement with five statements:

As a result of participating in LILT I can now . . .

- Use Lean methodology to identify key improvement opportunities for staff and patient experience;
- Improve safety and quality, optimize flow and reduce waste;
- Use data to understand the current state, guide improvement work, and monitor progress;
- Demonstrate Lean Leader behaviours as part of daily practice; and
- Engage in self-reflection and set goals for development as a Lean Improvement leader.

Respondents average rating of all five statements was “Agree” (Table 11).

Table 11. Results of participating in LILT

Rating statement: As a result of participating in LILT, I can now	Agreement (-2 to +2)
Use Lean methodology to identify key improvement opportunities for staff and patient experience.	0.8
Improve safety and quality, optimize flow and reduce waste.	0.8
Use data to understand the current state, guide improvement work, and monitor progress.	0.8
Demonstrate Lean Leader behaviours as part of daily practice.	0.9
Engage in self-reflection and set goals for development as a Lean Improvement leader.	0.8

1. n of respondents = 166-170.

Q13. The most important thing LILT does well

Respondents were asked the one most important thing LILT did well, that it should keep doing. The top five themes were (Table 12):

- Practical learning activities, related to the local work environment, to apply concepts (14 per cent);
- Excellent coaching and support between sessions, such as from the Kaizen Promotion Office or local Lean leaders (10 per cent);
- Collaborative, interactive sessions where participants share their improvement processes and ideas (9 per cent);
- Engaging staff at all levels in a culture of improvement (8 per cent); and
- Teaching specific, named skills (8 per cent).

Table 12. Themes of the most important thing LILT does well and should keep doing

Themes	Count (1)	%
Practical learning activities, related to the local work environment, to apply concepts	19	14%
Excellent coaching and support between sessions, such as from the Kaizen Promotion Office or local Lean leaders	14	10%
Collaborative, interactive sessions where participants share their improvement processes and ideas	12	9%
Engaging staff at all levels in a culture of improvement	11	8%
Teaching specific, named skills	11	8%
Provide excellent, understandable materials	10	7%
Teach continuous improvement	9	6%
Teaching process improvement tools so more people can understand them and participate in improvement.	8	6%
Using adult learning principles	8	6%
Flexibility to work in self-directed study, at your own pace, online	6	4%
Consistent, scheduled, focussed education sessions	5	4%
Continue with the training program	5	4%
Unclear / unsure	5	4%
Develop improvement leaders who understand front-line work	4	3%
Other	4	3%
Bringing attention to waste and how to avoid it	3	2%
Using feedback from participants to improve the program	3	2%
Nothing	2	1%
Total	**139**	**100%**

1. n of respondents = 139.

Q14. Suggested improvements to LILT

Asked to state the one most important thing that would make LILT even better, the resulting themes were much more fragmented than for the responses to other questions. The top four themes, which accounted for fewer than half (45 per cent) of the responses, were (Table 13):

- Detailed or specific changes (each specific proposal from one person only) (18 per cent);
- Address the time pressures with more realistic orientation to time required, time off work, more flexible scheduling, or more time between modules (12 per cent));

- Allow or create participant pairs or teams that work together on a local improvement projects (9 per cent); and
- Better instructors / instruction (7 per cent).

As well, many of the proposed changes were contradictory to other proposed changes. For example, some respondents proposed less instruction time and recognition of prior learning, while others asked for longer sessions and extended training. While five per cent of respondents wanted a greater focus of training on their specific work environment, none of the seven respondents wanted this focus on the same work environment. There were eight different proposals supported by only two or three respondents each. What drew together the majority of the responses was the desire to address the stress and time pressures of doing the training.

Table 13. Themes of suggested improvements to LILT

Themes	Count (1)	%
Detailed or specific changes (from one person each)	24	18%
Address the time pressures with more realistic orientation to time required, time off work, more flexible scheduling, or more time between modules	16	12%
Allow or create participant pairs or teams that work together on a local improvement project	12	9%
Better instructors / instruction	9	7%
Focus on adapting the program to a specific local work environment (health care / non-health care / support services / front-line service delivery / technology / community services)	7	5%
Consistent, capable, available local coaching support	6	4%
More classroom time	6	4%
More detailed training to explain how to do processes, showing examples, or showing results	6	4%
One bigger project to carry through all modules	6	4%
Extend the training to more people	5	4%
Less paperwork / forms	5	4%
No improvements needed	3	2%
Re-assess the sequence of modules	3	2%
Clearer expectations around time commitments	2	1%
Deliver modules in one-day blocks, with time for assignments	2	1%
Ensure written materials align with presentations	2	1%
Go to a different workplace to see what they are doing	2	1%
Include change management training to address buy-in of colleagues	2	1%
Let us see the presentations of other participants to improve our own	2	1%
Use prior learning assessment so participants with some previous background can fast track	2	1%
Can't say yet / don't know	5	4%
Not relevant to the question or unclear response	7	5%
Total	**134**	**100%**

1. n of respondents: 134.

Q15. Other comments

Asked if there were anything else they would like to say about their experience with LILT respondents' top four themes were (Table 14):

- LILT was a great training opportunity / rewarding experience / good program / a good experience / enjoyable / useful for new managers (37 per cent);
- Specific miscellaneous negative or critical comments (one person each) (17 per cent);
- LILT was a lot of work, on top of regular work / hard to fit into busy schedules / stressful (14 per cent); and
- There was great coaching / support / facilitation (13 per cent).

Table 14. Themes of anything else respondents would like to say about LILT

Themes	Count (1)	%
A great training opportunity / rewarding experience / good program / a good experience / enjoyable / useful for new managers	49	37%
Other specific miscellaneous negative or critical comments (one person each)	22	17%
A lot of work, on top of regular work / hard to fit into busy schedules / stressful	19	14%
Great coaching / support / facilitation	17	13%
Poor delivery / instruction / presenters	8	6%
Other specific miscellaneous positive comments (one person each)	7	5%
Unclear / can't say yet	6	5%
Getting buy in from other staff has been difficult	3	2%
Other specific miscellaneous comments (one person each)	1	1%
Total	**132**	**100%**

1. Up to two themes were taken from a comment; n of respondents = 106.

Interviews

In an attempt to contextualize the survey responses, gain deeper understanding of the views of LILT participants, and understand the responses of those who felt strongly about the program, either negatively or positively, the evaluators sought out a purposive sample of those participants who had completed surveys. A total of 16 participant interviews were completed January and early February 2016, as follows:

- Five of six pilot study respondents who responded and agreed to be interviewed, of 20 pilot study participants sent surveys;
- Five of eight participants who gave the most strongly disagreeing responses on Question 8, "I have found the materials applicable to my work" and agreed to be interviewed; and
- Six of the 15 participants who gave the most strongly agreeing responses on Question 8, "I have found the materials applicable to my work" and agreed to be interviewed.LT to revise this section}

Q1. Modules

Participants were asked to identify what modules they had completed in the LILT program (Table 15).

Table 15. Modules Completed

	Module	# of respondents who had completed module
1	Using visual management - Daily Visual Management	
2	Managing supplies - 5S and Kanban Ready	
3	Understanding your current state - Value Stream Mapping: Part 1	3
4	Improving your future state - Value Stream Mapping: Part 2	4
5	Supporting Kaizen events - Kaizen Event Process and Sustaining Improvement	2
6	Supporting change - PDCA, Standard Work / Work Standards and Replication	
7	Creating a visual workplace - Visual Control and Visual Management	
8	Optimizing flow - Improving Flow and Reducing Waste	2
9	Zero defects - Mistake Proofing and Patient Safety	1
10	Reflections on learning Lean - Capstone presentation	4

Q2. Worked well

Participants were asked, what has worked well about the process of delivering the Lean Improvement Leadership Training (LILT)? (Table 16). The following themes emerged.

Participants like the model of working with their colleagues to identify issues and possible solutions.

> *I think applying it to our own business - actually going into our own department and working through it- because it is an investment in time that aligns with the organizations' work.*

Participants enjoyed the time to work with others in their region and / workplaces to both talk about common issues, and to further develop the networks.

> *The opportunity to work with people from other departments. I am in a SILO of one- It is nice to see and interact with people and get an idea of what they are doing and how they are applying things.*

The third most popular item identified as being positive, is the teaching method that requires preparation and homework because it allows class time to be limited and focused on group interaction.

> *Having the teaching session, flowing by the practical application has really helped me to solidify the learning.*

Table 16. Worked well

Description	# of respondents who identified this worked well
Projects built practical experience through addressing current work challenges (and work with our colleagues)	9
Networking with others in the region / organization facing similar challenges / work but whom we would have otherwise not met	7
Model of preparation work and homework	6
The location was local – little travel required	3
Connecting with senior leaders directly as coaches and facilitators	3
The materials are good	3
The group was small so led to good discussions	2
The flipped classroom	2
All sessions were scheduled well in advance	2
Timing was achievable during regular work	2
The instructors are good	2
Modules concurrent	1
Self reflection	1
Nurse managers gained a better understanding of what goes on at their facilities	1

Q3. Suggestions to improve the process of delivering LILT

Participants were asked, "What would make the process of delivering LILT even better?" Many specific suggestions for improvements were identified (Table 17). Five participants identified the examples used in the course as requiring improvement. Their advice was somewhat contradictory.

- One respondent thought that the examples focused too much on the health care setting:

  The examples are all specific to medicine or frontline health.

- Some found the examples to be too generic:

  Examples used have not been helpful- too generic not (grocery store). These examples made it tough to follow.

Table 17. Improvements suggested

Description	# of respondents who identified this item
Examples were not relevant to office work and needed more detail to communicate their point	5
Would like more experiential learning and coaching to ensure success	2
Provide backfill support for my position to increase participation time	2
Class time was too short -- would like more time to interact with peers during class time to discuss modules	2
Materials need to be clearer about requirements of report outs	1
Facilitator needs to be better prepared	1
Course syllabus was neither clear nor followed	1
Some exercises seemed like a waste of time	1
Modules were siloed and time between was long; result was that it was difficult to hold concentration over time	1
Course was not local so extensive travel was required	1
Student projects need to be developed / chosen with care so that they will be useful for all modules	1
Disrupted due to external factor	1
Only person from workplace so difficult to do assignment. Should have more than one person from each workplace to support implementation	1

Q4. Changes to participant work practices

Participants were asked, have you changed how you do your work as a result of participating in LILT? (Table 18). There was general agreement that work practices had changed since taking the course. The four most frequent examples were the increased use of visual tools, an increase in regular meetings with staff, an overall increase in the use of Lean tools, and the use of data collection to guide analysis and planning.

Table 18. Changes to work

Description	# of respondents who identified this item
Increased use of visual tools.	9
Holding huddles / meetings on a regular basis.	6
Have improved / increased use of Lean tools that was already using.	6
Use data collection to analyze identified problems and to document progress.	5
Use Lean language with colleagues as a common language for improvement.	2
No	2
Increased consideration with planning and communication with staff.	2
Created value stream map / use more.	2
Using Plan / Do Check, Act.	2
5s	1
Kanban	1
Now waste more time tracking and reporting.	1
Created a future state and implemented quite a few changes based on that.	1

Q5. Program goals

Participants were asked, "As a result of participating in LILT, do you now do the following?" They were asked to provide one of the following responses: "Yes", "No", or "Partly or sometimes", and to give examples of the work when possible.

Participants reported an increase in activity around all of the program goals, with the exception of the final one, participating in networks of Lean improvement leaders.

Q5a. Use visual management tools / methods for daily continuous improvement?

Ten answered yes, four answered partly and two reported they were already doing these things prior to LILT. Examples given were:

- Implemented / improved visual wall (12)
- Huddles (3)
- Continuous improvement. (2)
- Track progress (2)

Q5b. Implement tools and methods to improve safety, optimize flow and reduce waste?

Thirteen answered yes, two answered sometimes and one answered that s/he was already doing these things prior to LILT. Examples given were:

- Data collection and VSM to identify problem / and or waste. (6)
- Regular forum to discuss ideas to meet this objective. (4)
- Removed unsafe and surplus materials. (4)

Q5c. Use data to understand, monitor and sustain unit / area progress?

Ten answered yes, three sometimes and two answered no. One answered that s/he was already doing these things prior to LILT. Examples given were:

- Implemented audits to identify and solve problems (7)
- Yes, but the work outweighs the benefit (2)
- DVM module helped to implement improved practice (2)

Q5d. Facilitate and engage staff in identifying, testing and implementing improvement ideas, and coach and mentor staff in using Lean tools?

Ten answered yes, four sometimes and one no. One answered that s/he was already doing these things prior to LILT. Examples given were:

- Engaging staff in specific Lean activities: 5s. (7)
- Always encourage employees to think of ways to improve (3)
- Difficult to get staff buy-in (2)
- Conflict between roles of manager and visionary (1)
- Daily huddle (1)
- No time (1)

Q5e. Engage in self-reflection and set goals for development as a Lean Improvement leader?

Seven answered yes, six answered no and two answered they had already been doing these things prior to LILT. One answered sometimes. Examples given were:

- Private self-reflection / goal setting. (4)
- Goals are always discussed when discussing Lean ideas. (1)
- Report outs include lessons learned. (1)

Q5f. Participate in any networks of Lean improvement leaders outside your organization?

All sixteen answered no. Comments included:

- Would like to do this (3)
- Have had LILT / Lean discussions through informal networks (3)
- Do this inside organization (1)

Q6. The most important thing that LILT does well

Respondents were asked to identify the one most important thing that would make LILT even better (Table 19). The model of providing training in manageable pieces in the context of their own workplace was the most commonly identified positive feature of LILT. The project of wider training of staff on Lean tools and techniques was also identified as a positive activity of the LILT program. Respondents felt that it would contribute positively to a shared language for management and change in the province.

> *Currently educating and training 9 of us, and if it comes back next year, it will get better because there will be more people who know what they want to achieve, so better buy in.*
>
> *I think that it is about bringing an appreciation and supporting the cultural aspects of Lean - rationale - why we are applying the tools and principles to this work. - Tools PLUS understanding of reason for them builds engagement and understanding to build that needed capacity.*

The final three points could be further grouped under the theme that LILT is a program that is improving the organization through the development of networks and relationships between different units and responsibility levels of staff.

> *Connecting leaders together. [Why is this important?] So that you have somebody else who you can talk to about your issues and bounce ideas off. This is especially important for people like us who manage in isolation.*

Table 19. What LILT does well

Description	# of respondents who identified this theme
Providing training during regular work duties, in manageable chunks, while building work networks and connections. Is respectful and doesn't feel like a burden. Is a good technique to support learning.	7
Training everybody about Lean and the importance of continuous improvement and methods for sustainable change. This increases knowledge, appreciation, and buy-in.	5
Coaching by Lean leaders from the same organizations as participants.	4
Encourages methods of organized communication with colleagues.	3
Encourages networking with others who are doing similar work in different locations.	2

Q7. The most important thing to improve LILT

Respondents were asked to identify the one most important thing that would make LILT even better (Table 20). Participants reported a variety of specific suggestions to improve the program.

Table 20. What would make LILT even better

Description	# of respondents who identified this work
Balance need to train all of the tools of Lean with local freedom to boost engagement by focusing on local issues and being responsive to the limited resources that are available. Use the tool to your benefit - but no more.	3
Modules should be taught by people with expertise and excitement.	2
Class time should be a bit longer to leave time to share our examples and have interactions with others in the class.	2
Provide resources for staff coverage to increase time and concentration required to participate fully.	2
Facilitators provide a list of projects to work on that have been identified by managers / directors as important issues to tackle. These projects should be workable as examples for all of the modules.	2
Subdivide LILT courses so participants come from similar programs. This will build networks and foster wider collaboration.	1
Ensure that each facility has either more participants taking LILT, or that there are others who understand what it is. Being one LILT trainee in a facility that does not have any training in Lean is very frustrating.	1
Plan for further training once course is complete.	1
Clarify steps in course to make expectations for participants more clear.	1

Q8. Other comments

Respondents were asked to tell us anything else they would like to say about their experience with LILT and the content (Table 21). They provided a variety of specific feedback and suggestions. The most frequent was that LILT is a good program, that they liked Lean and the material, that the coaching was excellent, and that they liked the monthly spacing of modules.

Table 21. Other thoughts

Description	# of respondents who identified this theme
I enjoyed it and think that it is a good program.	7
I like Lean and the material.	3
Excellent coaching.	2
I like the monthly timing (as opposed to a more intensive course).	2
Simplify. Managers may be too busy to take this training but should at least take an overview to understand what it is.	2
I like the peer interaction time that this provides.	1
Broken health care system. LILT doesn't improve.	1
Lean ideas are time consuming and take away from front-line care.	1
Program is time consuming but is worth it.	1
Some fellow participants were are drag.	1

Coaches/mentors and facilitators' input

While LILT program participants were surveyed, HQC staff advised the evaluation team that the group leading the program were not a sufficiently homogenous group to get meaningful data from a survey approach. Those in this leadership group were this asked to participate in interviews which were intended to produce more nuanced responses than those available from survey data. Facilitators were defined as those responsible for the delivery of the program. Coaches/ mentors were experienced Lean practitioners who agreed to mentor 2-3 course participants throughout the program.

Interviews

Overall response

Of a total of thirteen coaches/facilitators whose names were provided to the research team, eleven agreed to be interviewed. They were interviewed in late January and early February 2016.

Q1. Respondents' role

Respondents were asked to describe their role in implementing or leading LILT in their organization. Leaders reported multiple roles, with the most common being to both teach the modules and oversee and implement the program (Table 22).

Table 22. Role

	Noted Role	# of respondents who mentioned this role
1	Teaching / Facilitating the modules	10
2	Implementing the program	9
3	Coaching	5
4	Finding Coaches / engaging senior staff	4
5	Develop / adapt some of the module materials	3
6	Finding / selecting participants	2
7	Preparing and evaluating students in their report outs	1
8	Evaluation	1

Q2. Occupations and number of participants

Respondents described the participants in LILT that they have been involved with or observed.

Number of participants

The number of participants that each respondent reported they had worked with ranged from 7 to 73. The largest number of 73 was an outlier. The other ten respondents had been involved with total participant numbers ranging from 7 to 40, with a mean of 21. The total number of participants reported was 283.

Occupations of participants

Occupations of participants reported by coaches were mainly managers, senior leaders, and administrative staff (Table 23).

Table 23. Participant Occupations

	Occupations	# of respondents who mentioned this occupation
1	Managers: Facility / program / department (front line)	9
2	CEO, VP, directors and executive directors	9
3	Administrative staff	3
4	Communication specialists	1
5	Quality care coordinators	1
6	Business analysts	1
7	Pharmacist	1
8	Policy analysts	1
9	Physician	1
10	Senior Medical Officers	1

Q3. Worked well

Respondents reported a variety of things that worked well about the process of delivering the Lean Improvement Leadership Training (Table 24). Overall, the model of teaching and learning in their own workplace with colleagues was the most highly rated quality.

> *The fact that they are doing assignments on their own work processes – brilliant!*

The pace of the program also ranked highly on the list of positive qualities.

> *We do one module per month, it has allowed participants to go through the workshop at the beginning of the month, has allowed them to do the work, engage with the material in a way that has allowed them to really learn from them.*

Table 24. Things that have worked well.

	Quality	# of respondents who identified this quality
1	Assignments based on work related to real job with useful outputs	5
2	Timeline / pace was manageable	3
3	High quality mentors	2
4	Modules / materials easy to use	2
5	High quality Instructors	1
6	Small cohorts	1
7	Reading in preparation for the class time	1
8	Modules are concurrent	1
9	Engagement and support of senior leadership	1
10	Group work built staff relationships and networks	1

Q4. Support

Respondents were asked how well prepared and supported they felt for their role in the LILT program. There were three sub questions, which are listed below with the responses.

Q4a. Did you have the support you needed?

Eight respondents identified that they had support from leadership in their organization. Seven respondents identified that colleagues were supportive.

You don't know what you don't know. That would be the blessing and curse of being guinea pigs. Learn as we go. I certainly had lots of support from the organization.

Q4b. Was your role clear to you?

All respondents agreed that the role was clear. One person said that they have no way of knowing if they played their role correctly.

Yes, I was the one that kind of developed the schedule and program roll out.

Q4c. Did you feel confident in your capacity to deliver the content?

All 11 participants answered yes to this question, however, four noted that their skill developed through practice.

Never! [laughed] … It gets easier every time that you do it - learning things that you do differently - starting new cohort right now. Will do things a bit differently for the benefit of the students.

Q5. Suggestions to improve the process of delivering LILT

Respondents shared ten suggestions to improve the process of delivering LILT (Table 25). The importance of the role of strong Lean mentors/ coaches was the most frequent suggestion. Respondents suggested that mentors/ coaches be very comfortable with Lean.

We had some good mentors but some were more developed than others - particularly, around certifications. Some of them do not understand and cannot support the learners. This is a result of lowering the certification standard for the mentors (some were not as comfortable as others).

The second most frequently mentioned suggestion was to have more time to complete modules. Even though people reported approximately one month between courses, participants were often expected to do this on top of their regular work, which was already quite busy.

There is not enough time for the hands on work in the traditional model.

The third suggestion was to provide some guidance, and examples, of student projects that provide robust enough material to be used in each of the models that require an example, but would not be so big as to be overwhelming for participants. This suggestion for appropriate examples for student work was picked up in another suggestion from where two groups who had diverged from the LILT model to give students a more in-depth experience of what it is actually like to participate in Lean activities such as VSM and 5S.

Focus on participants to ensure that they scope projects appropriately. In the first group, some had large eyes – the point of the program is to learn the skill set, and the tools, not to try to solve the biggest problem in their department.

The fourth suggestion was that there be a province wide system to train the trainers and a communication network for trainers to discuss ideas and share resources.

I guess I'm a visual learner, so it would have been nice to have seen somebody else do the presentation first - train the trainer - because it was somebody else's material.

Table 25. Improvements suggested

Suggestion for improvement	# of respondents who identified this issue
Mentors should be comfortable with Lean.	5
More time to complete modules.	4
Participant project example must be small enough to accomplish, but large enough to carry through all the modules.	3
Training the trainer for facilitators.	3
4 days of intensive VSM training - collapses current state, optimizing flow and future state - just like JBM model, seeing the risk - people learn about the Current state in the value state (including a chance to practice). We are seeing almost all people leave the session thinking that they can do it - but they can't – want to set them up for success. We will also be doing this 4 day event model with 5S.	2
Add an introduction that explains the course overview.	1
Smaller cohorts to eliminate the need for Lean mentors.	1
Improve the materials used in the first 5 modules.	1
Add a database of clear and completed examples to learn from.	1
Communicate to regional leadership that dedicated time will be needed for participants and coaches.	1

Q6. Changes to participant attitudes

When asked if they have noticed any change in attitude in those participating in LILT, nine respondents answered yes to this question.

Q6b. If so, what change have you noticed?

Of those respondents who answered yes to Question 6:

All nine had noticed a positive attitude change in the majority of participants. In addition to having been happy to learn the new skills, the other reason given for positive attitude change was that participants finally understand the language and terminology of Lean.

> *Lots of Lean work in the last couple of years, but these people had not had the chance to learn with it in an in-depth way - seeking deeper understanding - beyond terminology - foundational principles and methodologies, and being able and interested in translating that to their front line staff. The material went from being distant and obscure to leading to understanding the heart beat of it and looking for ways to teach that to their own staff.*

Two of these nine noted that a small proportion of the participants had a negative attitude change. They attributed this to the added workload caused by the course.

> *Participants are really excited to start, and then dropped into the wallow curve and got overwhelmed, now seem to be out of that, but symptom of the first few modules being time intensive.*

A reason provided for the variation in attitude is that of motivation. The theory is that those who displayed a positive attitude are interested in knowing the language and tools of management, perhaps because of personal career goals to gain promotion in the future. On the negative end of the spectrum are people who were "volun-told" to participate and have not yet seen any value in learning the material.

Q7. Changes to participant work practices due to LILT

Q7a. Have you noticed changes?

When asked if they had noticed any changes in how LILT participants do their work, six respondents answered yes, and three more noted that they are beginning to see changes.

Q7b. If so, what change have you noticed?

The five respondents who answered yes to question 7a gave examples of changes to work that fell into four themes (Table 26). (Respondents gave multiple responses that were grouped into these categories.)

Table 26. Changes in participants' work noticed by coaches

Changes in work noticed by LILT trainers / coaches	# of respondents who identified this change in work
Demonstrating understanding of tools and concepts	9
Using Lean tools	8
Improved initiative	7
Confidence to discuss Lean concepts and improvement ideas	6

Q8. Program goals

The eleven coaches / facilitators were asked, "As a result of participating in LILT, do the participants you have observed now: (Yes? No? Partly or sometimes? Example?)"

Q8a. Use Lean methodology to identify key improvement opportunities for staff and patient experience?

Eight answered yes. Examples given were: value stream maps, Kaizen, spaghetti diagrams, client service, and walking maps.

Q8b. Improve safety and quality, optimize flow and reduce waste?

Nine answered yes. Examples given were: value stream maps, Kaizen.

Q8c. Use data to understand the current state, guide improvement work, and monitor progress?

Five answered yes and two answered somewhat. Examples for this question were limited.

Q8d. Demonstrate Lean Leader behaviors as part of daily practice?

Eight answered yes to this question. Examples cited included: more collaborative, more intentional cross functional work, thinking in a different way, readily using the skills they had learned such as daily visual management daily and mapping to plan their year.

Q8e. Engage in self-reflection and set goals for development as a Lean Improvement leader?

Five answered yes and one answered partly. Examples were limited.

Q9. Participation in Lean networks

Asked if they have seen participants in their organizations participate in networks of Lean improvement leaders outside their organizations, no respondents had heard of this.

Q10. The most important thing that LILT does well

Respondents were asked to identify the one most important thing that LILT does well, that it should keep doing (Table 27).

- Six respondents mentioned the importance of learning Lean, teamwork, staff engagement, and developing a shared culture of improvement language and concepts.

  It trains people to be Lean leaders, provides people with the knowledge and skills to do Lean work, be a Lean leader and use Lean management methodology. We had people begging to get in the program - senior leaders were using the language, the rest of team needed to know it.

Six respondents also reported the applied method of teaching was what LILT did well.

Keep the focus on the learn-do model. The priority is the growth and development of the individuals, not just passing and failing: what I am learning, how is it shaping me, and how can I be intentional about passing it on to others?

Table 27. What LILT does well

Description	# of respondents who identified this theme
Building staff engagement through teaching the concepts and language of Lean, which has been adopted by senior leadership	6
Using the applied learning approach	6
Providing a forum for works with similar challenges, to meet, network and discuss real-world scenarios	2
Training people to be effective leaders and managers	1

Q11. The most important thing to improve LILT

Respondents were asked to identify the one most important thing that would make LILT even better (Table 28).

Table 28. What would make LILT even better

Description	# of respondents who identified this theme
Follow up program with an ongoing support group to build skills. The LILT program is a very condensed version of Lean leader training so ongoing practice and support would help solidify the skills	2
Provide conditions (time or lower workload) so participants can fully engage in the learning	2
Organize the modules from simpler to more challenging so as to make the learning curve more flowing and successful earlier in the process	1
Example project should relate directly to participants' work	1
Provide a strong set of materials to teach with, that don't need to be edited locally (first 5 modules)	1
Focus more on the leadership required to do the work - to transform them as a leader -- (A-plus thinking)	1
Province should set clear expectations for regions: who should be trained, how many, etc.	1
Provide a network of support for teachers / facilitators to discuss common issues, share materials, learn from others.	1

Q12. Other comments

Respondents were asked to tell us anything else they would like to say about their experience with LILT and the content (Table 29).

Table 29. Other comments

Description	# of respondents who identified this theme
It covers a lot of information in a manageable way.	10
It is a good program	9
I am really happy to teach it.	7
Internally we have to use our resources to support it and tweak it as well.	6
Has improved staff morale / engagement around Lean and quality improvement.	5
Increase provincial oversight to ensure that regional leaders are giving this program adequate support and encouragement.	1
Flipped classroom method is fantastic.	1
Some difficulty with early modules but now improving.	1

Review of course materials

As noted in the Methods section of this report, the reviewer reviewed each of the ten online program modules to determine the fit between the stated goals of the module and the ability of the participant to meet these goals based on the content provided and the learning exercise to be completed. The program modules included:

- Daily Visual Management;
- 5S and Kanban Ready;
- Value Stream Mapping Part 1;
- Value Stream Mapping Part 2;
- Kaizen Event Process and Sustaining Improvement;
- Standard Work and PDCA;
- Visual Control and Management;
- Optimizing Flow;
- Mistake Proofing;
- Capstone Module.

In addition, online resources were provided for coaches and workshop facilitators. As previously noted, the reviewer's feedback focused largely on the modules themselves, and did not address the facilitator and coach resources extensively. The reviewer's detailed commentary on each module is included in Appendix 3.

The modules, with few exceptions, followed a standard format. Learning objectives were included for each module, with the exception of the capstone module, which used the program objectives to guide the participants' observations about their overall learning. The overall program objectives for participants, as listed in the program overview, were:

By the end of the program, participants would be able to:

- Use visual management tools and methods for daily continuous improvement.
- Implement tools and methods to improve safety, optimize flow and reduce waste.
- Use data to understand, monitor and sustain unit/area progress.
- Facilitate and engage staff in identifying, testing and implementing improvement ideas, and coach and mentor staff in using lean tools.
- Engage in self-reflection and set goals for development as a Lean Improvement leader.
- Develop strong networks with lean improvement leaders with the focus of shared learning.

The major strength of the program design is its applied nature. Each module included objectives that focus on knowledge (By the end of this module you will be able to describe…), skill development (By the end of this module you will be able to…) and application to the participant's daily work (By the end of this module you will have…). The principles on which it is based are listed in the program overview: self-directed learning, experiential learning, ongoing feedback and evaluation, self-paced learning, peer learning and support, and a continuous learning cycle. The format of the course consistently reflects these principles, with the provision of easily understandable learning materials, a variety of examples including those from lean implementation programs nationally and internationally, and powerful and relevant examples from the Saskatchewan Lean implementation experience. These applied examples, especially those from the local Saskatchewan context, are exemplary in assisting participants to understand and engage fully with course concepts. The assignments were also highly relevant and useful to participants in applying what was learned to their own workplace, and requiring them to implement concepts learned and use the tools described. A well developed, clear and concise rubric outlining what was expected in the evaluation of the assignment was included for each module. While the review identified some minor suggestions for changes to the modules, in the detailed review included in Appendix 3, the quality, relevance, and methodology employed in developing the course modules was extremely well conceptualized and implemented overall.

There was considerable consistency between the reviewer's findings in relation to the course content and processes, and the feedback provided by the participants, facilitators and coach/mentors. The program was generally reported to be well organized, and well facilitated. The applied nature of the program and the usefulness of the assignments was lauded by most participants and leaders. Where there appeared to be issues, they were generally with respect to the relevance of the examples provided, and discrepancies with the level of the materials. Some participants found the material too basic, while others found it too challenging. Potential reasons for these findings will be addressed in the discussion section of this report.

When reviewing the modules as part of a total program package, there does appear to be some minor unevenness in the expectations between modules. The earlier modules where concepts are introduced, explained and demonstrated could be viewed as more demanding than some of the later modules which are adding to the basic conceptual understanding in applying some additional concepts. Some modules are also more fully developed than others, with more and varied examples. Such unevenness of presentation is not unusual in early offerings of educational programs, and is resolved through minor tweaking as programs are delivered repeatedly over an ongoing period of time.

Discussion

In addressing the findings of the evaluation process, the following themes emerged.

Early indication of success

The evaluation data shows that the participants and leaders (coaches/mentors and facilitators) were generally very pleased with the content and processes surrounding the program. They found it well organized, relevant and appreciated the application to their workplace. Participants found the coaches and mentors supportive and the facilitators generally well prepared. While the feedback on the program was at times contradictory (an issue addressed in the next thematic section), it was generally very positive.

However, this indication of success must be viewed cautiously, given that only the first four modules had been completed by more than half of participants at the time of the survey.

A diverse group of learners with diverse needs

The evaluation process revealed divergent views in response to some questions. Some participants found the content too basic, while others found it challenging. Some reported that the examples were highly relevant, while others found them not relevant at all. These divergent responses are representative of the diverse groups represented among the participant group. The learning needs of front line staff in large urban health authorities may be quite different than those in smaller rural or northern areas. The needs of those in government offices and service centers such as 3 S Health, Saskdocs and STARS are in all likelihood different than the front-line, clinically based group of participants. In its early days, LILT has done a good job of attempting to address the needs of these diverse groups, but clearly, this will be an ongoing project.

Support from supervisor a key requirement for success

The strongest positive agreement about the program from participants was with respect to the support to participate provided to them from their supervisors. This illustrates the importance of such support to the success of LILT in the long term.

Importance of participant engagement with Lean

Survey and interview data of both participants and leaders indicated that engaging learners with Lean was a major part of the success of the program. While Lean had been percolating around these learners for a long time, and was a key initiative locally and provincially, for many of the participants this was the first opportunity to engage with the language and concepts of Lean, and to in turn engage others in their workplaces. This engagement appears to not only have increased their understanding of Lean, but for some, their excitement and support of it.

Importance of networking

Participants found the networking with other participants, and others from their region, a vital part of the success of the program. It should be noted however, that the program goal of “development of networks and relationships between different units and responsibility levels of staff” was not reported as met by either participants or leaders.

Unevenness in continuity and flow

The reviewer found minor unevenness in the volume and depth of content in the modules, with some having considerably more complex content and resources than others. The first module contained a large amount of new content and terminology, while some others were less complex. This is not unusual in a new program, and minor tweaking will improve continuity and flow as the program evolves.

Measuring sustained behavior change and impact on quality

Participants and leaders both reported seeing behavior change in practice in relation to implementation of the course concepts and tools. Kirkpatrick & Kirkpatrick's (2006) model of learning evaluation sees behavior change (Level 3) arising from a positive reaction to learning (Level 1) and evidence of learning gain (Level 2). While participants involved in this evaluation process reported behavioral change in themselves and/or others in the workplace as a result of the program, it is important to validate the existence of these changes, and to continue the evaluation process to see that such behaviors are sustained over time. As noted in the findings of the literature review, there are additional factors which impact skill transfer, such as the supportiveness of the organizational culture and the presence of sufficient resources and rewards for change. It is necessary to evaluate the success of such educational programs in relation to the ongoing organizational context. In the longer term it is also important to assess and compare the outcomes of the LILT program with the Lean program quality improvement indicators which LILT is intended to impact (Kirkpatrick & Kirkpatrick's Level 4 outcomes).

Support for flipped classroom approach

Participants in the flipped classroom model rated ease of use of the LILT program, quality of materials, and applicability of the materials to their work higher than those in a traditional program. The positive validation of this delivery method supports its inclusion as a valuable learning option.

Support for the applied nature of the program

There was consistent support for the applied nature of the program. While time constraints were an issue raised frequently with respect to workload (see next section), the general view was that the content was highly relevant and the assignments valuable. With the exception of some of those from more diverse workplaces (see earlier section of this discussion addressing diverse workplaces) the feedback about the applicability of the program was highly positive. Comments such as "The fact that they are doing assignments on their own work processes—brilliant!" and "The assignments were highly relevant" indicate that the program has been very successful in this area.

Support for time requirement a significant issue

The most consistent finding throughout this study related to the amount of time required to participate in the program, and the lack of appropriate support to accommodate this time. While there was little feedback that the program itself was too time consuming, there was consistent feedback that there was insufficient time given at work to accommodate the time required. Even in situations where individuals were given time off to complete program work, there was no backfill provided for them in their regular positions, which meant that their work awaited them when they returned. This poses a significant challenge to the sustained success of the program over time.

Conclusion and recommendations

In conclusion, the initial data indicates that the program is meeting its intended objectives in a well-organized, relevant manner that is well received by the participants and those involved in the leadership and implementation of the program within the regional health authorities. While no major revisions were deemed necessary, the following recommendations arose from the themes identified during the evaluation process.

Develop an ongoing evaluation plan that addresses sustained change and outcomes related to quality improvement

There needs to be follow up evaluation with the current cohort of participants, given that less than half of those surveyed had completed more than four of the ten modules. This evaluation should be part of a comprehensive, ongoing evaluation process that looks not only at self-reported attitudes toward the program and the learning involved, but on measures of sustainability of behavior change on an ongoing basis. As the evaluation plan for the Lean program itself becomes more developed (Rotter et al., 2014), the findings of the ongoing LILT program evaluation process can be linked to the overall Lean program outcomes with respect to the quality improvement initiatives that the LILT program is intended to address.

Expand networking opportunities within the program

Given the value participants placed on the networking opportunities that they received during the program, and the program goal of increasing networking opportunities between units and among differing levels of staff, LILT program planners should ensure that existing opportunities for networking are retained and enhanced, and that opportunities for engagement beyond one's own unit and with staff at different administrative levels within the organizations are maximized.

Support flipped classroom initiatives

Given the very positive feedback from participants with respect to the flipped classroom pilot project, and the neutrality of the literature with respect to the effectiveness/ineffectiveness of this model, LILT program staff should feel comfortable in providing this option to regional health authorities wishing to use it in the future, with continued comparison of evaluative data of participants in the flipped and traditional classroom approaches.

Work with regional health authorities to ensure ongoing supervisor support

Given the importance placed by participants in this evaluation project on the ongoing support of their supervisors, it is essential that the HQC staff continue to work with RHA administrators to ensure that supervisors understand the importance of their support to the success of the participants. Supervisors need to be clear regarding how best to support the participants in order to maximize benefit to the LILT participants.

Continue to enhance the applied nature of the program, with specific focus on the needs of the diverse groups involved

As the program continues to develop, more Saskatchewan based examples from each of the diverse workplace types engaged in the program (front-line clinical, office based support, central administration etc.) will strengthen the relevance and effectiveness of its application for participants.

Address continuity and evenness of expectations between program modules

As the program continues to evolve, minor tweaking of the content and resources available in each module in order to make them more comparable in complexity and workload will result in more similar expectations between modules.

Ensure more support for participant time to engage in the program

The most concerning finding in the evaluation project was the consistency and frequency of unease with the lack of time provided in the workplace to participate in the program. There did not appear to be concern that the program was too demanding. In fact, there was support for the program and the education that it provided. The concern was with respect to the lack of time provided by the health authorities for the participants to attend classes and workshops, prepare the necessary material and complete the assignments. Even for those who were provided time in lieu of work to engage in all aspects of the course, the frequent concern raised was that their regular work awaited them when they returned. These time constraints for participants have the potential to seriously impact the success of the LILT program in the long term. Many of the participants in the program at this point are likely early adopters and leaders in their organizations. As the program evolves to include additional people in the long term, future participants may not be as willing as these were to make the time sacrifices necessary without the necessary backup and commitment from their employing organizations.

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Appendix 1. Survey

Evaluation of Lean Improvement Leaders Training (LILT) for the Health Quality Council by Horizon Strategic Consultants for Dr. Lois Berry.

Introduction

Dr. Lois Berry is an independent evaluator engaged by the Health Quality Council to evaluate LILT. She is an Associate Professor in the College of Nursing at the University of Saskatchewan. Horizon Strategic Consultants is conducting this survey on behalf of Dr. Berry. We are surveying all participants in the LILT program to get your input.

We are sending you this survey at your individual work email address. This link is for your use only. This link identifies your response with you. We do this to allow us to send reminders if you have not yet completed the survey and to match your responses to the type of LILT program you have participated in.

We will not publish any individual results or share any individual results with the Health Quality Council or your Employer. While analyzing answers on our computer systems, we will double password protect the answers. After we have completed our analysis of the survey, we will erase the original answers and the identifying information.

The overall results of the evaluation, including these survey results, will be used to assess how the LILT program is working for participants, and how it can be improved. Dr. Berry will provide an evaluation report to HQC, and may also publish a research article on the results of the evaluation.

If you have any concerns or questions about the overall evaluation, contact Dr. Lois Berry at lois.berry@usask.ca.

If you have concerns or questions about the administration of this survey, contact Barb Crockford at barb.crockford@horizonstrategies.ca.

Please start with the survey now by clicking on the *Continue* button below.

1) Where are you in the LILT program?

- ○ Have not yet started.
- ○ Have started the program

2) Modules

Please check the last module you have completed. (Completion of a module includes completion of the online module or in-person workshop, plus the hands-on component/assignment.)

- ○ Using visual management - Daily Visual Management
- ○ Managing supplies - 5S and Kanban Ready
- ○ Understanding your current state - Value Stream Mapping: Part 1
- ○ Improving your future state - Value Stream Mapping: Part 2
- ○ Supporting Kaizen events - Kaizen Event Process and Sustaining Improvement
- ○ Supporting change - PDCA, Standard Work / Work Standards and Replication
- ○ Creating a visual workplace - Visual Control and Visual Management
- ○ Optimizing flow - Improving Flow and Reducing Waste
- ○ Zero defects - Mistake Proofing and Patient Safety
- ○ Reflections on learning Lean - Capstone presentation

If your region or organization has included other module(s) as part of your LILT program, please list it / them:

For each of the following questions, please indicate on the five point scale your response to each statement, from -2, strongly disagree to +2, strongly agree:

	Strongly disagree -2	-1	0	+1	Strongly agree +2
3) I have been easily able to access the Lean Improvement Leadership Training (LILT) materials.	○	○	○	○	○

***If you answered -2 or -1 to the above question,* please tell us why:**

	Strongly disagree -2	-1	0	+1	Strongly agree +2
4) I have found it easy to use the LILT learning program (materials, assignments, and feedback).	○	○	○	○	○

***If you answered -2 or -1 to the above question,* please tell us why:**

	Strongly disagree -2	-1	0	+1	Strongly agree +2
5) I had support from my supervisor to participate in LILT.	○	○	○	○	○

***If you answered -2 or -1 to the above question,* please tell us why:**

	Strongly disagree -2	-1	0	+1	Strongly agree +2
6) I have had time to participate in the LILT program.	○	○	○	○	○

***If you answered -2 or -1 to the above question,* please tell us why:**

	Strongly disagree -2	-1	0	+1	Strongly agree +2
7) The materials were of good quality.	○	○	○	○	○

If you answered -2 or -1 to the above question, **please tell us why:**

	Strongly disagree -2	-1	0	+1	Strongly agree +2
8) I have found the materials applicable to my work.	○	○	○	○	○

If you answered -2 or -1 to the above question, **please tell us why:**

9) The three modules that were most applicable to my work were (Please check up to three):

- ☐ Using visual management - Daily Visual Management
- ☐ Managing supplies - 5S and Kanban Ready
- ☐ Understanding your current state - Value Stream Mapping: Part 1
- ☐ Improving your future state - Value Stream Mapping: Part 2
- ☐ Supporting Kaizen events - Kaizen Event Process and Sustaining Improvement
- ☐ Supporting change - PDCA, Standard Work / Work Standards and Replication
- ☐ Creating a visual workplace - Visual Control and Visual Management
- ☐ Optimizing flow - Improving Flow and Reducing Waste
- ☐ Zero defects - Mistake Proofing and Patient Safety
- ☐ Reflections on learning Lean - Capstone presentation
- ☐ Other module(s) as part of your region or organization's local program (please list):

Please tell us why these were the most useful modules

10) The most important thing I have learned from participating in LILT is ...

11) The one thing in my work that I have changed as a result of LILT is ...

12) As a result of participating in LILT, I can now:

	Strongly disagree -2	-1	0	+1	Strongly agree +2
Use Lean methodology to identify key improvement opportunities for staff and patient experience.	○	○	○	○	○
Improve safety and quality, optimize flow and reduce waste.	○	○	○	○	○
Use data to understand the current state, guide improvement work, and monitor progress.	○	○	○	○	○
Demonstrate Lean Leader behaviours as part of daily practice.	○	○	○	○	○
Engage in self-reflection and set goals for development as a Lean Improvement leader.	○	○	○	○	○

13) The one most important thing that LILT does well, that it should keep doing, is ...

14) The one most important thing that would make LILT even better would be ...

15) Tell us anything else you would like to say about your experience with LILT:

16) Would you be willing to participate in a 20-minute interview about your experience with LILT?

- ○ Yes - (If you respond "Yes", we may contact you for a telephone interview.)
- ○ No

Appendix 2. Interview guides

Participants' interview guide

Evaluation of the Health Quality Council Lean Improvement Leaders Training – Interview questions for *participants*

January 13, 2016

Dr. Lois Berry, R.N., PhD, evaluator

Interviews conducted by Stephen Weiss, M.A., Horizon Strategic Consultants

Introduction

This interview is part of an evaluation to assess how well the LILT program is working and how it can be improved. The interview will take about 20 minutes to complete. If you participate, we will send you a short report of the results.

We are interviewing on behalf of Dr. Lois Berry, who is leading the project as an independent evaluator engaged by the Health Quality Council. She is an Associate Professor in the College of Nursing at the University of Saskatchewan.

Your interview results will be anonymous. We will not publish your name or disclose whether or not you participated in an interview in our report, nor will we share that information with the Health Quality Council or your Employer. We may use quotes from what you say, but we will not use any quote that could identify you. You may decline to answer any question, and you may withdraw from the interview at any time.

The overall results of the evaluation, including a summary of the interviews we have done, will be used to assess how the LILT program is working for participants, and how it can be improved. Dr. Berry will provide an evaluation report to HQC, and may also publish a research article on the results of the evaluation.

If you have any concerns or questions about the *overall evaluation,* contact Dr. Lois Berry at lois.berry@usask.ca.

If you have concerns or questions about the *administration* of this survey, contact Barb Crockford at Barb.Crockford@HorizonStrategies.ca.

Before the interview starts, you will be asked whether you consent to proceed with the interview under these conditions.

Interview questions

1. What module have you completed in the LILT program?
2. What has worked well about the process of delivering the Lean Improvement Leaders Training (LILT)? Why?
3. What would make the process of delivering LILT even better? Why?
4. How have you changed how you do your work as a result of participating in LILT?
5. As a result of participating in LILT, do you now:
   - Use visual management tools/methods for daily continuous improvement?
   - Implement tools and methods to improve safety, optimize flow and reduce waste?
   - Use data to understand, monitor and sustain unit / area progress?
   - Facilitate and engage staff in identifying, testing and implementing improvement ideas, and coach and mentor staff in using lean tools?
   - Engage in self-reflection and set goals for development as a Lean Improvement leader?
   - Participate in any networks of lean improvement leaders outside your organization?
6. If so, please describe.
7. The one most important thing that LILT does well, that it should keep doing, is . . . ? Why?
8. The one most important thing that would make LILT even better would be . . . ? Why?
9. Tell us anything else you would like to say about your experience with LILT.

Coaches' interview guide

Evaluation of the Health Quality Council Lean Improvement Leaders Training – Interview questions for coaches, facilitators and mentors

January 13, 2016

Dr. Lois Berry, R.N., PhD, evaluator

Interviews conducted by Stephen Weiss, M.A., Horizon Strategic Consultants

Introduction

This interview is part of an evaluation to assess how well the LILT program is working and how it can be improved. The interview will take about 20 minutes to complete. If you participate, we will send you a short report of the results.

We are interviewing on behalf of Dr. Lois Berry, who is leading the project as an independent evaluator engaged by the Health Quality Council. She is an Associate Professor in the College of Nursing at the University of Saskatchewan.

Your interview results will be anonymous. We will not publish your name or disclose whether or not you participated in an interview in our report, nor will we share that information with the Health Quality Council or your Employer. We may use quotes from what you say, but we will not use any quote that could identify you. You may decline to answer any question, and you may withdraw from the interview at any time.

The overall results of the evaluation, including a summary of the interviews we have done, will be used to assess how the LILT program is working for participants, and how it can be improved. Dr. Berry will provide an evaluation report to HQC, and may also publish a research article on the results of the evaluation.

If you have any concerns or questions about the *overall evaluation,* contact Dr. Lois Berry at lois.berry@usask.ca.

If you have concerns or questions about the *administration* of this survey, contact Barb Crockford at Barb.Crockford@HorizonStrategies.ca.

Before the interview starts, you will be asked whether you consent to proceed with the interview under these conditions.

Interview questions

1. What has been your role in implementing or leading LILT in your organization?
2. Describe the participants in LILT that you have been involved with or observed.
3. What has worked well about the process of delivering the Lean Improvement Leaders Training (LILT)?
4. How well prepared and supported did your feel for your role in the LILT program?
5. What would make the process of delivering LILT even better?
6. Have you noticed any change in attitude in those participating in LILT?

   If so, what change have you noticed?
7. Have you noticed any change in how they do their work in those participating in LILT?

   If so, what change have you noticed?
8. As a result of participating in LILT, do the participants you have observed now:
   - Use Lean methodology to identify key improvement opportunities for staff and patient experience?
   - Improve safety and quality, optimize flow and reduce waste?
   - Use data to understand the current state, guide improvement work, and monitor progress?
   - Demonstrate Lean Leader behaviours as part of daily practice?
   - Engage in self-reflection and set goals for development as a Lean Improvement leader?
9. Have you seen participants in your organization participate in networks of lean improvement leaders outside your organization?

   If so, please describe.
10. The one most important thing that LILT does well, that it should keep doing, is . . .
11. The one most important thing that would make LILT even better would be . . .
12. Tell us anything else you would like to say about your experience with LILT and the content.

Appendix 3. Detailed review of the program modules

Module	Objective	Reviewer comments
1. Daily Visual Management	By the end of this module, you will be able to describe the: • Purpose of daily visual management. • Key components of DVM boards such as QCDSM measures, purpose/process, improvement work, and communication tools. • Purpose and process for DVM huddles. • Purpose and process of leading and learning from safety huddles.	Purpose of DVM well outlined in participant guide. Section on Benefits of DVM is particularly strong. DVM Board Video clip support understanding, although the presentation was at times “jargony”, and on occasion spent more time describing what was being measured, rather than why, and how such measures were useful and important to the unit. Team huddle video clip was one way communication session, with no feedback or interaction from other staff. The module describes huddles as problem solving sessions, but the video conveyed a one way communication purpose. This undersells the value of huddles. Examples of key components provided ie. purpose statements from actual sites using the process. QCDSM measures described. The linkage between daily metrics and strategy at a unit, region and provincial level is well described. Links between metrics and huddles are well described.
	By the end of this module, you will be able to: • Demonstrate that the visibility wall and staff huddles are a regular and meaningful part of your area's daily management routine. • Select appropriate measures and targets for your DVM wall. • Facilitate data collection on the gemba. • Identify meaningful ways to display data. • Analyze data and identify opportunities for improvement. • Engage staff in wall huddles, including safety huddles, with a focus on problem-solving and coaching. • Develop and implement standard work for DVM.	The assignment for this module required that the participant present pictures of DVM board, explain the metrics on the board and how they were chosen, outline to updating mechanisms, and describe how one of the metrics chosen rolls up to department, region/organization or provincial measures. It required that participants outline the process for huddles, and the evolving development of huddles in the participant’s unit. The assignment required that the participant outline processes for sharing ideas and creating action items, and provide examples. The assignment required that the participant outline next steps for improving huddles and DVM boards. The assignment provided an excellent opportunity for the participant to apply concepts learned. There is a well-developed rubric for assessing the assignment.

Module	Objective	Reviewer comments
	As result of completing this module, you will have: • A DVM board in your area. • Identified measures specific to your area with a process for data collection. • Identified measures that align with overall corporate objectives and measures. • Successfully implemented daily huddles and safety huddles. • If not already in place, standard work developed for: • Updating the DVM board • Board huddles • Tracking and testing improvement ideas	The evaluator is unable to evaluate whether these activities actually took place.
2. 5S & Kanban	By the end of this module, you will be able to describe the: • Purpose and process for completing 5S. • Importance of visual management in organizing materials. • Purpose and types of Kanban systems. • Relationship between 5S and Kanban in managing supplies. • Difference between current supply chain management and just-in-time methods.	The learning materials accompanying this module are well laid out, simple and clear. The video clips are excellent—simple, clear, straightforward. The techniques used to highlight changes in actual unit areas as a result of using 5S techniques were very simple and effective (pop up labelling highlighting the changes). The narrated PowerPoint slide videos were straightforward and clearly presented, largely free from jargon and hyperbole. The video outlining the Kanban processes used in the RQHR Emergency clean supply rooms gave an excellent visual reality to the Kanban processes, and the stories of successes and challenges were very instructive and provided strong real life evidence supporting the use of the process.

Module	Objective	Reviewer comments
	By the end of the module, you will be able to: • Select an area for a 5S project (scoped appropriately). • Facilitate/lead a team in completing a 5S, following the provincial standards. • Implement a communication plan for sharing 5S with area staff. • Complete the forms required for documenting a 5S event. • Develop audit measures and tools for monitoring your 5S results.	The assignment at the end of this module required the participant to present the actual results of staffing, defining an action plan required close out of the 5S newspaper items that were not completed during the week, and highlighting the 5S audit process. The participant was required to provide the following (Taken from the Report out Format provided to the student) Team Photo 5S Project Form Pre 5S Evaluation Score Pre 5S Target Sheet and data that would be applicable (space used, restock cycle time, missing items, time spent looking for items, etc.) Present (3) changes tried and order as follows: pre 5S photo, ideas sheet, post 5S photo (note: ideas sheets to show newspaper item number – write as NP#x) Photo of communication board Standard work for audit process Audit tool Multi-skills training form Red Tag Action Log Post 5S Evaluation Score Newspaper (to do list), and highlight any open items Next areas identified for 5S Final 5S Target Sheet 5S Results Form & Lessons Learned Thank You list to acknowledge people in the area who assisted with the 5S project The marking rubric for the assignment was made available to the participant in the learning module materials. This assignment requires effective application of the theory and concepts provided in the learning module materials
	As a result of completing this module, you will have: • Completed 5S in one area. • Used a tool and process for auditing your area. • A plan for ongoing 5S in your area. • Standard work for auditing, order/restocking, or anything else as needed.	The evaluator is unable to evaluate whether these activities actually took place.

Module	Objective	Reviewer comments
3. VSM Part 1	By the end of this module, you will be able to describe the: • Importance of value stream mapping (VSM) for understanding the process flow. • Relationship between time and flow. • Difference between lead time and cycle time, value add and non-value added time. • Purpose of product/patient quantity analysis (PQA) to analyze the process. • Components of a current state value stream map.	Role and benefits of value stream mapping well laid out in the participant guide. Key elements of process are effectively addressed. The PQA examples address clinical problems and demonstrate the usefulness of the process effectively. The emphasis that there is no “right or wrong” choice of what to map is an important one, and emphasizes the importance of “just doing it”. PowerPoint examples embedded in the guide make worksheets accessible. Depiction of Kaizen bursts on process maps was effective for visually representing the concept. The video clip “Everybody get lean” is amusing, but needs some context. Is there time provided for participants to address some of the humorous but relevant issues that arise in the video\? Is there an opportunity for participants to dialogue and explore some of the myths and misconceptions depicted in the video? Key points summarize unit messages well. Discussion forum gives participants an opportunity to identify some of the aspects that they value in receiving exceptional service, and may provide an opportunity for participants to see the variation in how individuals define exceptional service.
	By the end of this module, you will be able to: • Complete time observations on the gemba. • Collect and analyze PQA data for a given process. • Build a current state map, following the established standards.	The assignment included provides an opportunity to use concepts taught in real life situations. Participants are required to complete a value stream map using the concepts learned, including time calculations, observation forms, completed standard work sheets, and a description of the ways in which staff were involved in and informed of the process. The assignment related directly to the concepts learned in this process and provided excellent opportunities for learning. Expectations were clear with the provision of required report out format and the feedback rubric to participants in the participant learning package.
	As a result of completing this module, you will have: • A current state value stream map for a process in your area.	The evaluator is unable to evaluate whether these activities actually took place.

Module	Objective	Reviewer comments
4. VSM Part 2	By the end of this module, you will be able to describe the: • Components of a value stream map - both current and future state.	The participant guide outlines how the current state value stream map contributes to the development of the future state map. The delineation of the seven wastes and the seven flows was valuable. This unit would have benefitted from some video clips of real examples of how the current state value stream map contributed to the future state map, and a description if the real life processes that took teams through the processes (i.e. examples of "waste detective work" and flow analysis). The photo examples were helpful, but a description of the process in a real life example would have provided powerful support regarding the importance of this step in the QI journey. The concepts of primary and secondary drivers are complex. A video clip discussing a real example would have been instructive for participants in applying the concepts. The imbedded links to the question sheet and idea summary sheet were helpful. The inclusion of the discussion exercise was an effective learning tool. As the assignment indicates, "…the power of this exercise is in the discussion". The definitions of the driving forces provided an important opportunity for discussion and provision of examples. The discussion questions focused on assisting the participants to articulate their learning in the unit, and how they would implement what they have learned.
	By the end of the module, you will be able to: • Analyze the current state to identify kaizen bursts. • Recommend improvements for the future state. • Engage area staff in analyzing current state and identifying opportunities for improvement.	The assignment required the participant to complete a value stream mapping future state process, and to discuss the process of developing the map with the group. Clear guidelines for the assignment and a well-developed outline of the criteria by which the participant would be evaluated were included in the participant guide.
	As a result of completing these modules, you will have: • A future state VSM. • Kaizen bursts to PDCA as part of continuous daily improvement work. • Identified kaizen events for improvement efforts. • A posted VSM on area DVM.	The evaluator is unable to evaluate whether these activities actually took place.

Module	Objective	Reviewer comments
5. Kaizen Events & Sustaining Improvement	By the end of the module, you will be able to: • Describe the role of the process owner in a kaizen event. • Explain how to sustain improvement and describe the purpose of the audit process. • Determine how to select audit measures. • Develop a corrective action plan and countermeasures for a red audit measure. • Engage staff in supporting kaizen events • Incorporate kaizen event results into daily visual management.	Descriptions of kaizens, daily kaizens kaizen events and hoshins were well articulated. The inclusion of the "radiology bubbles" example of a daily kaizen was simple and effective. The description of the differences between types of kaizen events is effective. Again, inclusion of real life examples would strengthen the information provided. (Note: The evaluator could not differentiate between the role of the sponsor and the process owner on the basis of the description provided). The audit case descriptions were instructive in assisting participants to understand the concepts, as was the inclusion of the "5 whys" concept in root cause analysis. The root cause case study provided a real life example of application of the concepts included in the guide. The emphasis on documenting improvements is an important concept. Providing a completed example of the Corrective Action Plan template would have been helpful. The discussion of implementing change was helpful, including Kotter's 8 steps for change and the humorous video clip. The Patient and Family Involvement video is excellent! The discussion question encourages dialogue about participant experiences as a process owner/ front line leader, and how the participant communicated with staff about kaizen events. The dialoguing of experiences is an important part of the learning process. The RPIW video in the additional resources section is an excellent real life example. Consider moving it into the participant guide as an expected part of the learning process.
6. Standard Work and PDCA: Supporting Change	By the end of this module, you will be able to describe the: • Purpose and process for using PDCA cycles. • Rationale for standardizing processes. • Differences between standard work and work standards. • Importance of training staff on standard work.	The description in the module of improvement as the "sweet spot" combining thinking and doing leading to positive change is effective. Good examples of problem identification and use of fishbone diagrams provided. The video clip about the doctor's PDCA cycle to improve his hand washing provided a brief and simple example of the PDCA cycle. The process of reducing the incidence of wrong physicians listed on chart was another effective example. The job instruction video is instructive and well illustrates the principles involved in work instruction approaches. The section on engaging staff provides outlined steps and a photo of a Daily Huddle Board with balloons outlining steps in identifying and acting on unit improvements. While this pictorial discussion was helpful, it would have been even more helpful to include real life examples of some of the improvements identified on a unit and follow them through the process. In the Patient and Family Considerations section the link to a patient involvement continuum document did not work at the time this review was undertaken.

Module	Objective	Reviewer comments
	By the end of this module, you will be able to: • Complete an idea sheet and test it using PDCA cycles. • Engage staff in identifying and testing ideas (small tests of change). • As part of daily visual management, develop a process for tracking ideas (if not already in place). • Develop standard work or a work standard for an area process. • Create a training plan for staff, using a multi-skills checklist. • Develop an audit process for ensuring standard work or work standard is followed on the gemba.	The participant assignment included gathering and tracking improvement examples, reflecting on the QI process, developing standard work processes describing what led to this development, and describing the process of development, value stream mapping, root cause analysis , sharing an idea sheet and one PDCA, and identification of a training program for those requiring training. This is a comprehensive and very valuable real life assignment for participants, but it is quite time and labor intensive. The survey and interviews reported that time commitment and lack of release time or backfill for regular job duties was a significant challenge for those participating (See Findings section of this report). Careful attention needs to be paid to the work expected of participants under the existing participation practices. As noted previously, the inclusion of a feedback rubric was very helpful. The additional resource videos (Everybody get Lean, Bert and Ernie Cookies in Bed are humorously demonstrate the concepts of Lean and QI. The additional blog posts were also very valuable. However, the volume of material made available needs to be evaluated in relation to the participant feedback about time demands.
	As a result of completing this module, you will have: • Documented standard work or work standards. • Multi-skills worksheet and training plan. • Process for gathering, testing, tracking and implementing ideas.	The evaluator is unable to evaluate whether these activities actually took place.
7. Visible Improvement: Creating a Visual Workplace	By the end of this module, you will be able to describe the: • Purpose and benefits of a visual workplace. • Levels of visuals (indicator, signal, control, guarantee). • Components of a visual workplace. • Basic concepts in human factors theory as it relates to visual management and systems.	The concept of making work visible is explained in an easily understandable manner. The benefits of a visual workplace are clearly defined. The levels of visuals are explained an examples given in a way that supports the explanations. The components of a visual workplace are clearly outlined and the visual workplace cycle described. The inclusion of the Stroop test as an example of the importance of congruence in timely assimilation of information was highly effective. “Hank’s Story” was an excellent example of the usefulness of visual workplaces.
	By the end of this module, you will be able to: • Identify opportunities to improve flow and reduce waste through visual management. • Create and test a visual tool for your area. • Create and test a visual display (production or flow board) for your area. • Engage staff in testing and using visual management strategies in area. • Incorporate visual management into continuous daily improvement.	The discussion question for this module requires sharing an example of visual tools for the participant’s area, and observations/questions about how visuals work and could be improved. The report out assignment requires that the participants create a visual tool, find three examples of visuals on the gemba and identify their level, effectiveness and suggest improvement(s). In addition, the participant was to test a visual display or metric for managing daily work or review current tools and identify successes, areas for improvement. These assignments applying the concepts of the module are highly useful in assisting the participant to understand and use the concepts in their daily work. Additional resources are very useful and appropriate to module objectives.

Module	Objective	Reviewer comments
	As a result of completing this module, you will have: • Visual management tools in your area.	The evaluator is unable to evaluate whether these activities actually took place.
8. Optimizing Flow	By the end of this module, you will be able to describe the: • Importance of optimizing flow. • Types of flow and how they work together. • Importance of identifying and eliminating waste. • Differences between types of waste.	This chapter builds on concepts previously covered. "Right care, right place, right time, every time" Very "catchy" way of depicting the concept of flow. Types of flow are outlined. The Mendez video pushes the thinking about patient flow by proposing that the patient stays where they are and the system accesses information about patient progress through technology. Examples are given of flow in both clinical and non-clinical settings. The discussion of differ types of flow is relevant. The example regarding flow of family is a powerful one. Medication flow and equipment flow examples are effective. The inclusion of discussion about open family presence policy as an example of flow pushes the participant to think "outside the box" with respect to the concept of flow.
	By the end of this module, you will be able to: • Complete a waste walk in your area and identify at least one example for each type of waste. • Identify opportunities for PDCA to eliminate waste. • Examine the flow of a given process, with a particular focus on the patient and family flow. • Complete a spaghetti diagram to understand flow for a process. • Identify opportunities to PDCA improvements to flow. • Add the types of flow to your VSM for a visual of how they are working together. • Engage staff in identifying waste and problem solving to improve flow.	The discussion question asks the participant to apply concepts of flow, 5S and VSM to their own area, and to reflect on what changes have come about as a result of the work done in this area. The assignment requires completion of a waste walk, creation of idea sheet addressing waste, and requires the participant to outline a PDCA. It requires the participant to create a spaghetti diagram, to add flow to VSM and to identify kaizen bursts. These are all highly relevant exercises for those in clinical settings. The E-Health Help Desk Improvement Story included in the additional resources is an effective example of making change in a related health area. The example is relevant to clinical settings as well.
	As a result of completing this module, you will have: • A waste wheel for your area. • Idea sheets for eliminating waste. • Value stream map of flows for a given process. • Spaghetti diagram of flow for a given process.	

Module	Objective	Reviewer comments
9. Mistake proofing	By the end of the module, you will be able to describe the: • Purpose of mistake proofing. • Role of root cause analysis in identifying opportunities for improvement. • Difference between mistakes and defects. • Rationale for zero defects. • Importance of self-check and successive checks. • Importance of standard work and work standards in maintaining a zero defects process. • Impact of visual controls on supporting a zero defects work environment.	Theresa Malloy-Miller's story of her son's experience in health care is a powerful message, as is the video on the response to safety events. Her description of "Communicating in a fog. Not being listened to" was very powerful. The module provides solid examples related to past concepts, and introduces new concepts effectively.
	By the end of the module, you will be able to: • Complete a root cause analysis. • Evaluate a current process and identify opportunities for mistake proofing. • Select quality improvement measures to understand and monitor the defect rate. • Engage staff in PDCA to eliminate defects for a given process.	The discussion forum question asks participants to reflect on experiences with mistake proofing, and the occurrence of errors in their units. The report out assignment requires them to identify a target for mistake proofing, conduct a root cause analysis, identify idea sheets, kaizen bursts, and examples of PDCAs tested. As well as outlining the process of monitoring the identified defect over time. Completion of these steps should provide the participant with excellent opportunities to apply the module concepts.
	As a result of completing this module, you will have: • Defect data to measure quality. • Completed Fishbone or root cause analysis for a defect. • PDCA options for eliminating defects.	The evaluator is unable to evaluate whether these activities actually took place.

Module	Objective	Reviewer comments
10. Capstone	There are no new objectives for the capstone module. The program objectives are included in this module to guide reflection on learning: • By the end of the program, you will be able to: • Use visual management tools and methods for daily continuous improvement. • Implement tools and methods to improve safety, optimize flow and reduce waste. • Use data to understand, monitor and sustain unit/area progress. • Facilitate and engage staff in identifying, testing and implementing improvement ideas, and coach and mentor staff in using lean tools. • Engage in self-reflection and set goals for development as a Lean Improvement leader. • Develop strong networks with lean improvement leaders with the focus of shared learning.	The capstone presentation is designed to document reflection, self-assessment and future goals. It provides an opportunity for the participants to tell the story of their learning experience. The three components expected of the presentation are reflections on learning, reflections on the experience of learning and plans for ongoing professional development. Well-developed presentation guidelines are included. Resources are included for mind maps, and concept mapping. The module provides sufficient opportunity for participants to synthesize and apply the concepts presented throughout the course.