Vermont Early Literacy Initiative -- Science, Technology, Engineering & Mathematics (VELI-STEM) Project

Evaluation Report: Analysis of Librarian Post-Training Survey Data

May 2017

SURVEY OVERVIEW: On April 24 and 25, 2017, the VELI-STEM Year Two Librarian Training: STEM Inquiry – Building and Engineering was held at Lake Morey, Vermont. In keeping with the process for administering last year's survey after the April 2016 Year One training on Force and Motion, an on-line survey link was distributed on the afternoon of the second day of the training via email to the primary point of contact for each of the 25 VELI-STEM libraries in the current sample. The purpose of administering the post-training survey was to:

a. Assess the effectiveness of the April training and shape future trainings;
b. Measure changes in librarian proficiency in key constructs involved in the delivery of STEM programming to 3-7-year-old children, since a baseline measure was taken in February 2016 prior to librarians receiving any training and since the prior year's training;
c. Inform future replication of the VELI-STEM project in Vermont and nationally.

The 2017 post-training survey measured almost identical constructs as those that were measured at baseline, as well as those that were measured after the April 2016 training and that will continue to be measured along the course and at the end of the VELI-STEM project. Measurement of these constructs helps gauge progress toward and the final achievement of the following two intended project outcomes:

1. Participating VELI-STEM librarians are better able to recognize opportunities to incorporate ongoing STEM learning experiences for 3-7-year-old children and their families throughout their library-based and community-based practice.
2. Participating VELI-STEM librarians are more intentional in highlighting STEM literacy in Story Times and all other child and family focused programming.

All 25 VELI-STEM librarians responded to the survey, leading to the findings contained on the following pages.

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STEM Knowledge & Skills – Comparative Analysis					
Librarian self-assessment of their STEM knowledge and skill level on a *scale of 1-5	**Baseline** (February 2016)	**After the Two-Day Training** (April 2016)	**Change in Percentage Points from Baseline**	**After the Two-Day Training** (April 2017)	**Change in Percentage Points from Baseline**
Ability to identify opportunities to incorporate ongoing STEM learning experiences for 3-7-year-old children and their families	3.9	4.7	↑0.8	4.8	↑0.9
Ability to regularly provide opportunities for 3-7-year-old children to use basic science practices	3.1	4.6	↑1.5	4.8	↑1.7
Sense of the different settings in which STEM learning experiences can be provided	3.8	4.6	↑0.8	4.8	↑1.0
Access to/likeliness to use STEM training and other resources	3.4	4.8	↑1.4	4.9	↑1.5
Averages=	**3.6**	**4.7**	↑1.1	**4.8**	↑1.3
Ranges =	**3.1-3.9**	**4.6-4.8**	**↑0.8-1.5**	**4.8-4.9**	**↑0.9-1.7**

*Scale of 1-5, with 5 being fully proficient.

STEM Knowledge & Skills – Key Analysis High-lights

There was an overall uptick in all STEM knowledge & skill areas since the project was launched and since last year's training:

- **Highest Score** – The highest score of 4.9 was on the likelihood of using STEM training and other resources following the training, which was also the case on last year's post-training survey. Compared to a 3.4 on access to STEM training and other resources prior to the training, this year's score represents an increase of 1.5 percentage points or a 44% rate of improvement since the project was launched.
- **Lowest Score** – Scores were high across the board, with the "lowest" score of 4.8 for 3 of the 4 STEM knowledge and skill areas (ability to identify and regularly provide STEM learning opportunities for 3-7-year-old children in different settings).
- **Biggest Gain** – The biggest gain since the project was launched was 1.7 percentage points on regularly providing STEM learning opportunities for 3-7-year-old children, which had the lowest baseline score (greatest amount of room for improvement).
- **Smallest Gain** – The smallest gain since the project was launched was just under a percentage point (0.9) on ability to identify STEM learning opportunities for 3-7-year-old children, which already had the highest baseline score (least amount of room for improvement).

STEM Concepts & Delivery – Comparative Analysis					
Librarian self-assessment of their understanding of STEM concepts and delivery on a **scale of 1-5	**Baseline (February 2016)**	**After the Two-Day Training (April 2016)**	**Change in Percentage Points from Baseline**	**After the Two-Day Training (April 2017)**	**Change in Percentage Points from Baseline**
STEM inquiry	N/A (not measured at baseline)	4.5	N/A	4.6	N/A
STEM Force and Motion concepts	3.6	4.7	↑1.1	N/A	N/A
STEM Building and Engineering concepts	N/A (not measured at baseline)	N/A (not covered at April 2016 training)	N/A	4.8	N/A
STEM Water and Air concepts	3.7	N/A (not measured since not covered in Year One)	N/A	N/A	N/A
STEM Sound and Light concepts	3.2	N/A (not measured since not covered in Year One)	N/A	N/A	N/A
What it means to engage children in science-learning opportunities within a context of science engineering practices	3.5	4.5	↑1.0	4.8	↑1.3
How to encourage children to develop and use a range of science practices as described in the Next Generation Science Standards	2.3	3.9	↑1.6	4.1	↑1.8
How to transfer acquired STEM knowledge and skills to early childhood educators in library's community	3.0	4.2	↑1.2	4.5	↑1.5
How to conduct STEM outreach and informational exchanges with library's community	2.9	4.3	↑1.4	4.4	↑1.5
Averages =	**3.2**	**4.3**	**↑1.1**	**4.5**	**↑1.5**
Ranges =	**2.3-3.7**	**3.9-4.7**	**↑1.0-1.6**	**4.1-4.8**	**↑1.3-1.8**

**Scale of 1 to 5, with 5 indicating that they strongly agree that they *have* an understanding (baseline) or a *better* understanding (post-training).

STEM Concepts & Delivery – Key Analysis High-lights

There was an overall uptick in understanding of all STEM concept & delivery areas since the project was launched and/or compared to last year's training survey scores (as applicable):

- **Highest Score/Smallest Gain** – The highest score of 4.8 was on engaging children in science-learning opportunities within a context of science engineering practices and on understanding Engineering & Building concepts, the latter of which was corroborated by anecdotal feedback indicating that this year's project focus is more rife with programming possibilities than last year's focus on Force & Motion. The 1.3 percentage point increase on engaging children in science-learning opportunities was the smallest gain among all STEM concept & delivery areas, but still represents a 37% rate of improvement since the mid-range baseline score of 3.5 (only moderate room for improvement).
- **Lowest Score/Biggest Gain** – While encouraging children to develop and use a range of science practices as described in the Next Generation Science continues to generate the lowest score at 4.1 (and generated some anecdotal feedback about limited understanding or lack of awareness of any training on Next Generation Science Standards), the 1.8 percentage point gain represents the largest gain for any STEM concept & delivery area, indicating that training in this area has been effective for most librarians.

In Their Own Words

The last field of the survey offered librarians an optional opportunity to provide open-ended comments, observations, and suggestions about the April 2017 two-day training on STEM Inquiry – Building and Engineering, with 22 (88%) of the 25 survey respondents offering feedback. Consistent with February 2016 baseline and April 2016 training surveys, comments on the April 2017 post-training survey conveyed an overall excitement about the project. Some dominant themes emerged about specific aspects of the training and about the project overall, with the two most frequent themes being praise for the training and excitement about and gratitude for involvement in the project:

Key Themes	TOTALS
Praise for training (feeling well-equipped, sense of being prepared)	18
Excitement about and gratitude for involvement in the VELI-STEM project	10
Enormous value of hands-on trainings for librarians (VELI-STEM trainings fill a critical need for Vermont librarians)	10
Suggestions for future trainings	9
Usefulness and quality of materials distributed at training	8
Collaborative training worked well & presenters great individually	7
Engineering & Building more rife with programming possibilities than Force & Motion (and ties in well with Summer Reading Program)	6
Miscellaneous comments	5
Helpfulness of opportunity for peer exchanges	4

The most common themes are listed below with sample (de-identified) comments[1]:

- **Praise for training** (feeling well-equipped, sense of being prepared)
  - This was an amazing training. It completely revived and motivated me. I am really looking forward to another year of VELI-STEM.
  - The VELI STEM training was great! Although a long 2 days…I have a better understanding of how to incorporate this knowledge and using the supplies and books to plan my upcoming programs. The training taught me how to … discuss and engage young children-as well as for all ages!
  - Having gone through the first cycle, I was able to put the concepts into a working format for my library and community. It made much more sense and I am able to see multiple ways I can incorporate the STEM lessons into storytimes and outreach.

[1] A full transcript of all comments and suggestions has been compiled in an Excel spreadsheet that is searchable by comment category and will be shared internally with the VELI-STEM Leadership Team, for their determination of any necessary follow-up action or course corrections.

- **Excitement about and gratitude for their involvement in the VELI-STEM project**
  - This was an amazing training. It completely revived and motivated me. I am really looking forward to another year of VELI-STEM.
  - We enjoyed all aspects of the training. We were energized, better educated and inspired to spend the next year building!
  - Thank you for this opportunity! I am already excited for my upcoming events!
- **Enormous value of hands-on trainings for librarians** (VELI-STEM trainings fill a critical need for Vermont librarians)
  - Thank you for providing another wonderful, hands on and engaging workshop. During a conversation with other librarians at the conference, it [was] mentioned how without VELI, there were really no other hands on, "useful and practical" training workshops available to children's librarians here in Vermont. The importance of VELI to our Libraries is huge. Through these opportunities we are provided with training, experience and guidance- all which greatly helps to 1) build our knowledge 2) build our confidence and 3) provide us with ideas to replicate in our communities and 4) supply us with materials to share with families and utilize within the library, that we would otherwise not be able to afford.
  - This VELI-STEM training is an invaluable opportunity for us youth librarians to explore, plan, play, and bounce ideas off of one another.
  - I liked the combination of hands-on activities mixed with the sound teacher/facilitator practices.
- **Suggestions for future trainings**
  - It would be helpful if we spent a little more time on reporting. Having discussion about people's experiences would be beneficial for stream lining and brainstorming. Each time we leave these intensive trainings it seems like many of us are confused about what the requirements of us are and what needs to be reported when.
  - For future training, I wouldn't mind if at least one of the fun hands-on activities was saved for the second morning. I'm also torn about the evening activity - they are a lot of fun and feel a lot more informal than what went earlier in the day and I do enjoy that atmosphere. But, it also makes for a rather long day, and this time around I was exhausted and ready to be done.
  - I would have liked a handout out with the actual expectations in writing - one childcare, one family night, so many programs, this form to this person by this date, etc. It would have fit nicely with the yellow and pink papers we received at the beginning. I don't think anyone would "only do the minimum" as the grant results have shown from the first year. To me, it eases stress about expectations if they are made very clear.
- **Usefulness and quality of materials distributed at training**
  - I feel like I had a grasp on all of these things prior to this training but now I have what I need to focus on building and engineering for the next bunch of months. And so many books! I have so many wonderful new books!
  - Another great training. I can't wait to experiment with my libraries new "goodies"- especially the Keva planks, and share them with my library community.
  - The books and materials provided are fantastic and I'm looking forward to more STEM programming!
- **Collaborative training worked well & presenters great individually**
  - We learn so much at these trainings, it takes a few days to really process it all. The facilitators were great, so knowledgeable. They are able to break down the information so that we can use it in our programs. I am so energized when I get back to the library to start planning my programming. Thanks
  - The collaborative nature of the instruction worked for this topic.
  - As usual the presenters were incredibly helpful!

- **Engineering & Building more rife with programming possibilities than Force & Motion** (and ties in well with Summer Reading Program)
  - I was pretty excited last year, but more so at the end of this conference. Part of this might be that it is year two and so some of this was revisiting what we knew, and had been successful with already. This phase of the program also feels more pregnant with possibility. There are so many ways to go with engineering and building it will be easy to keep going for a long time without anyone feeling a little tired of the topic. It was a rejuvenating and invigorating spa for the library brain two days. I think we all went away feeling ready to charge into a year of inspiring future engineering brains!
  - The training was fun and engaging, and I learned so much- a great model for how to conduct STEM programming. I'm excited to get started planning. This year's topic feels easier to incorporate into library programs, and I really appreciate that it aligns with the Summer Reading Program so nicely.
  - This year's theme has resources [that] are much richer than last year. I feel like a super hero! I am confident and curious about the experiences I can provide; and all of their complexities and outcomes. I am also not worried about not knowing all the answers; and looking forward to exploring them with children, parents and care givers. Thank you! ~~From the bottom of my tower, tunnel, bridge, car garage or airport. Onward and UPWARD!
- **Miscellaneous comments**
  - I am grateful for the VELI STEM website … so that we have access to all of the information that was covered at the training to refer back to and use.
  - The only area I still have some stretching to do (not just of myself but of my board) is the reaching out to the community aspect of promoting this. But even that feels more possible this year.
  - After this [2-day training] I am not only more confident with my programming, but also had many questions answered about the grant and data collection.
- **Helpfulness of opportunity for peer exchanges**
  - It was … beneficial to be the "child", brand new at all these activities and discussing with other Librarians thoughts and ideas.
  - It's always reassuring to be able to talk with my peers. It helps alleviate anxieties and I often come home with some great ideas for programs.
  - I enjoyed hearing and speaking with other librarians about planning.