SCLDA/Lenovo 'Week of Service' Evaluation

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Executive Summary

The Smithsonian Center for Learning and Digital Access (SCLDA) collaborated with Lenovo for the development, implementation and evaluation of six educational hands-on activities for elementary and middle school students. The Smithsonian Learning Lab (SLL), developed and managed by SCLDA, was used to create collections that accompanied each activity. Collections could be used as instructions for an activity and/or as a part of an activity itself. A subset of the Lenovo volunteers participated in training sessions on how to facilitate the implementation of these activities and tested a training guide for conducting them. A total of 130 volunteers facilitated the hands-on activities with 910 middle and elementary school students in North Carolina during Lenovo's Week of Service. A SCLDA staff member trained a subset of volunteers, who then trained the other volunteers. All of the volunteers received the training guide.

Classroom observations and a survey, implemented to gather feedback on the activities, training sessions and guide, demonstrated that overall the Lenovo Week of Service/SCLDA project was successful. Students enjoyed the activities and showed high-level engagement. A slightly lower level of engagement occurred in activities with younger students, specifically kindergarteners, who required more assistance by adults. Of the six observations, evaluators reported only one occasion in which students used a SLL collection during the activity. During this particular activity, students displayed very high levels of engagement. The students easily navigated the collection and paid close attention to the included videos.

The volunteers valued the training and the training guide and provided constructive feedback. The majority of the survey respondents were trained in person or by phone by a Smithsonian staff member. The majority agreed that the training was well organized, the main points were well covered and clear and the facilitator demonstrated comprehensive knowledge of the subject matter and conveyed ideas effectively and clearly. Almost all of the respondents felt that the materials were informative and easy to understand.

Overall recommendations for the training sessions from the survey:
- Include more time for participants to practice how to facilitate students' activities
- Include more information about the topic areas the activities covered
- Match the materials (e.g., fabrics, glue, batteries) in training and in the classroom.

Concerning the training guide, survey respondents reported that having a written training guide with the activity information, materials and instructions was valuable and that the guide was clear and a good reference tool.

Overall recommendations for the training guide from the survey and the observations:
- Include more detailed information about the topic areas to share with students
- Include step-by-step and age-targeted scaffolding instructions
- Include specific information about incorporating the SLL collection in the activity

Introduction

The Smithsonian Center for Learning and Digital Access (SCLDA) collaborated with Lenovo, a multinational technology company[2], for the development, implementation and evaluation of educational hands-on activities for elementary and middle school students. Developed and managed by SCLDA, the Smithsonian Learning Lab (SLL), a web-based learning platform, was used to create collections that accompanied each activity. These collections could serve as a set of instructions to implement the activity and/or as a part of an activity to offer a context for the students by providing other pertinent resources. A total of 130 volunteers, employees from Lenovo, identified as leaders (n= 26) or as helpers (n= 104), participated in the project in various classrooms during Lenovo's Week of Service.

A subset of the volunteers participated in training sessions. A SCLDA staff member trained 21 of the 26 leaders, who then trained the other volunteers (referred to as "helpers"). Each training session addressed how to facilitate the implementation of the activities. All of the volunteers received a training guide for conducting the activities and the related SLL collections. The guide also included a list of the supplies needed for each activity. The activities were:

- Sculptris: create a 3-D model of an insect based on specimens from the Smithsonian's National Museum of Natural History
- E-textiles: combine circuitry and fabric to create a wearable tech item
- Wright Flight: learn the basic engineering skills used by the Wright brothers; conduct a digital test flight of a 3-D model of the original Wright Flyer in the Smithsonian's National Air and Space Museum
- ArtBots: construct an art-making robot using motors, batteries, and whimsy
- Botany Field Book: learn Botany techniques inspired by a National Museum of Natural History botanical illustrator
- CURIO: experience a trading-card game that challenges students to discover patterns and connections to create their own Smithsonian-inspired collection

The purpose of the project was to expose students to a wide variety of hands-on STEAM related activities and to increase their confidence to further pursue STEAM topics. The activities took place during Lenovo's Week of Service at two middle schools in Raleigh, North Carolina (NC) and one elementary school in Durham, NC. A total of 910 students were reached through the activities (Table 1).

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[2] https://en.wikipedia.org/wiki/Lenovo

Table 1: Lenovo Week of Service Activities

School	Date	Grades	# of students
Carroll Middle School	April 3, 2017	6th -8th	360
East Millbrook Middle School	April 3, 2017	6th-8th	300
Reaching All Minds Academy (elementary school)	April 6, 2017	K-5th	250

Though the same educational activities were used in both the middle and elementary schools, they were modified to fit each age group. The Smithsonian content (through SLL collections) provided context for the activities by presenting additional related resources (Figure 1 and 2).
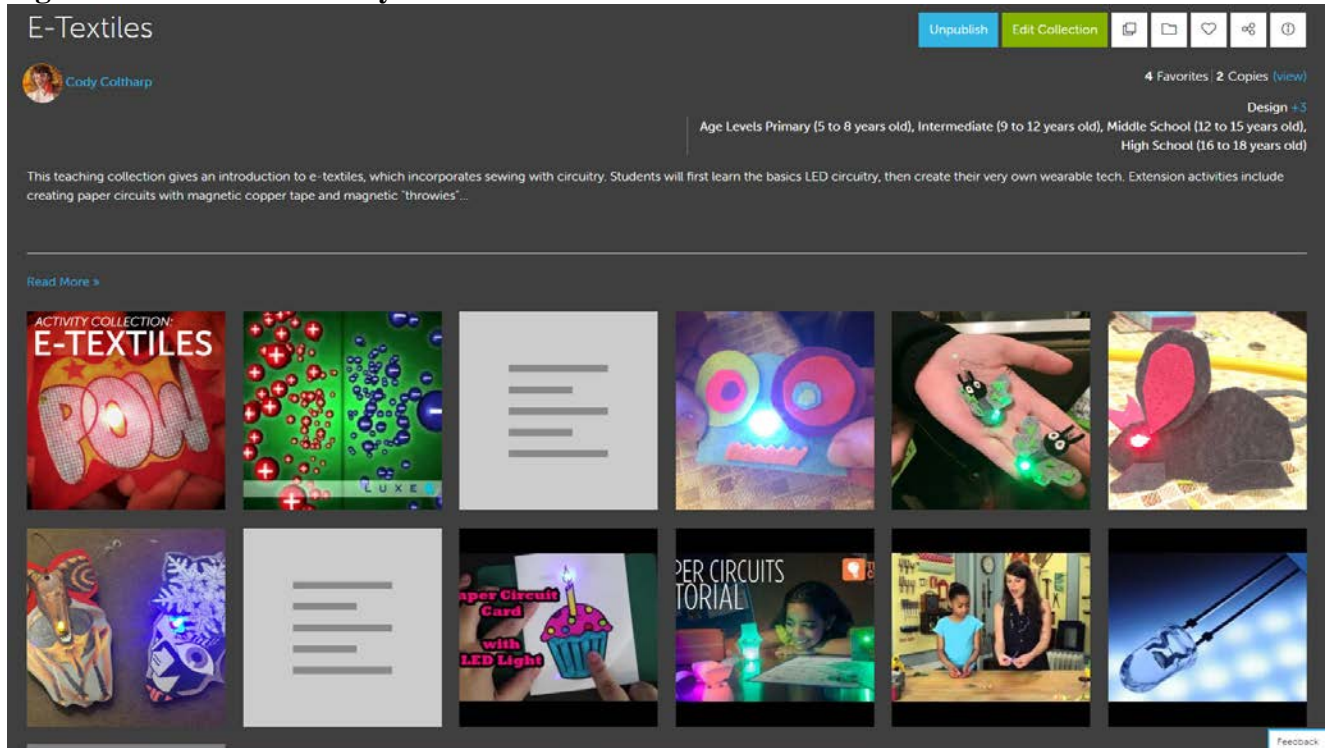
Figure 1: Botany Activity SLL Collection

Figure 2: E-Textiles Activity SLL Collection

Fifty laptop computers were provided for the event at the elementary school while the middle schools had varying degrees of access to technology. A SCLDA staff member was onsite to assist with all three events.

To prepare the volunteers to facilitate the activities, SCLDA staff developed professional development training sessions and the training guide. The volunteers identified as leaders were trained in-person in NC in March 2017. At that time, they were provided a training guide on how to facilitate the activities with SLL collections.

An evaluation of the project was conducted to understand students' engagement with the activities, assess the effectiveness of the training sessions and training guide and gather volunteers' impressions on the implementation of the activities. This summary report presents the findings.

Methodology and Description of the Sample

Observations
The sample included six classrooms at the elementary school Reaching All Minds Academy. Two SCLDA staff evaluators observed activities. The observation length was a classroom period where one activity was completed. The unit of observation was the entire classroom. The methodology followed best practice for peer observations by using a checklist and rating scale as well as an open-ended written response for observers to complete. Engagement was scored using a 5 point scale across five different categories, including 1) positive body language, 2) consistent focus, 3) verbal participation, 4) student confidence, fun & excitement and 5) overall engagement. The observation data were analyzed through a simple descriptive statistical analysis for the closed-ended scales and by coding the open questions by emerging categories.

Survey
An online survey was sent to the entire group of volunteers (130 volunteers including the 26 leaders). The survey was comprised of both closed and open-ended questions, and gathered information on three areas: the training received, the training guide and the actual implementation of the activities. Please see the exact survey questions in the appendix. The survey data were analyzed through a simple descriptive statistical analysis for the closed-ended scales and by coding the open questions by emerging categories.

Findings and Recommendations

Observations
Observations were gathered from six activities that occurred at the Reaching All Minds Academy (activities at the two middle schools were not observed). The overall students' engagement during all of the observed activities was high. Older elementary students showed high levels of engagement. A slightly lower level of engagement occurred in activities with younger students, specifically kindergarteners, who required more assistance by adults. Some of the kindergarteners were either unable to implement instructions on their own or were disengaged by the amount of information. This suggests that instructions with age-targeted scaffolding is required in the training guide to better engage students of various age groups. During the activities, the volunteers facilitated discussion with the students, and took the primary role as the instructors for the assignments.

Of the six observations, evaluators reported only one occasion in which students used the SLL collection during the activity. The 3-D modeling activity, Sculptris, involved discussions about bugs and animation. Each student had a laptop to access the collections related to the activity. The collection included sketches and models made for the animated film *A Bug's Life* as well as videos showing how the animations were made. After the students went through the collection, they opened up a separate application to try 3-D modeling for themselves. During this particular activity, students displayed very high levels of engagement. The students easily navigated the SLL collection and paid close attention to the videos. They also easily used the animation application.

Survey

An online survey was sent to the 130 volunteers with thirty responding. All of the participants identified themselves as Lenovo employees. A majority of the respondents (roughly 67 percent; n=21) had received in-person training from a SCLDA staff member. The additional volunteers who responded to the survey were trained by another leader (n=5), by another helper (n=3) and by reading the training guide instructions (n=1). A majority of the responses (n=27) were from participants who volunteered at one of the two middle schools: roughly 47 percent (n=14) volunteered at the East Millbrook Middle School and 43 percent (n=13) at Carroll Middle School. Five participants from the Reaching All Minds Academy responded to the survey. Roughly 53 percent (n=16) of the responses came from volunteers who worked with sixth-grade students (Table 2). Approximately 43 percent (n=13) of the respondents facilitated the Botany Field Book activity with the remainder spread among the other activities except the Curio Card game (Table 3).
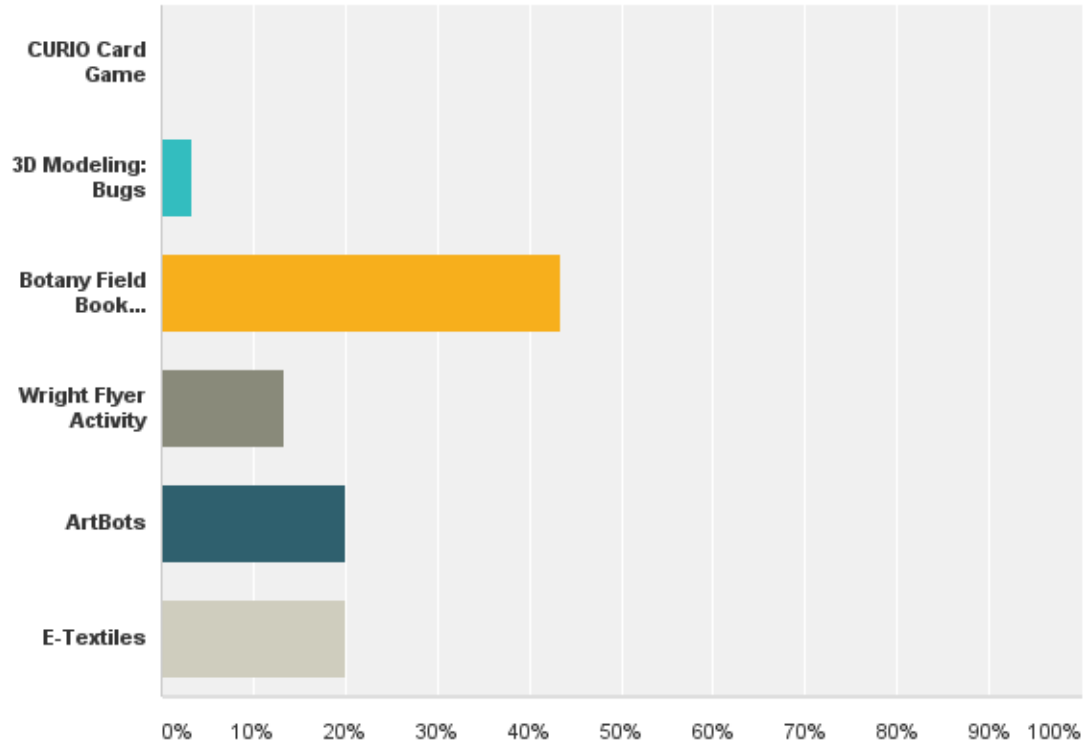
Table 2: Grade Levels

Q5 Which Grades did you work with?
(please check all that apply)

Answered: 30   Skipped: 0
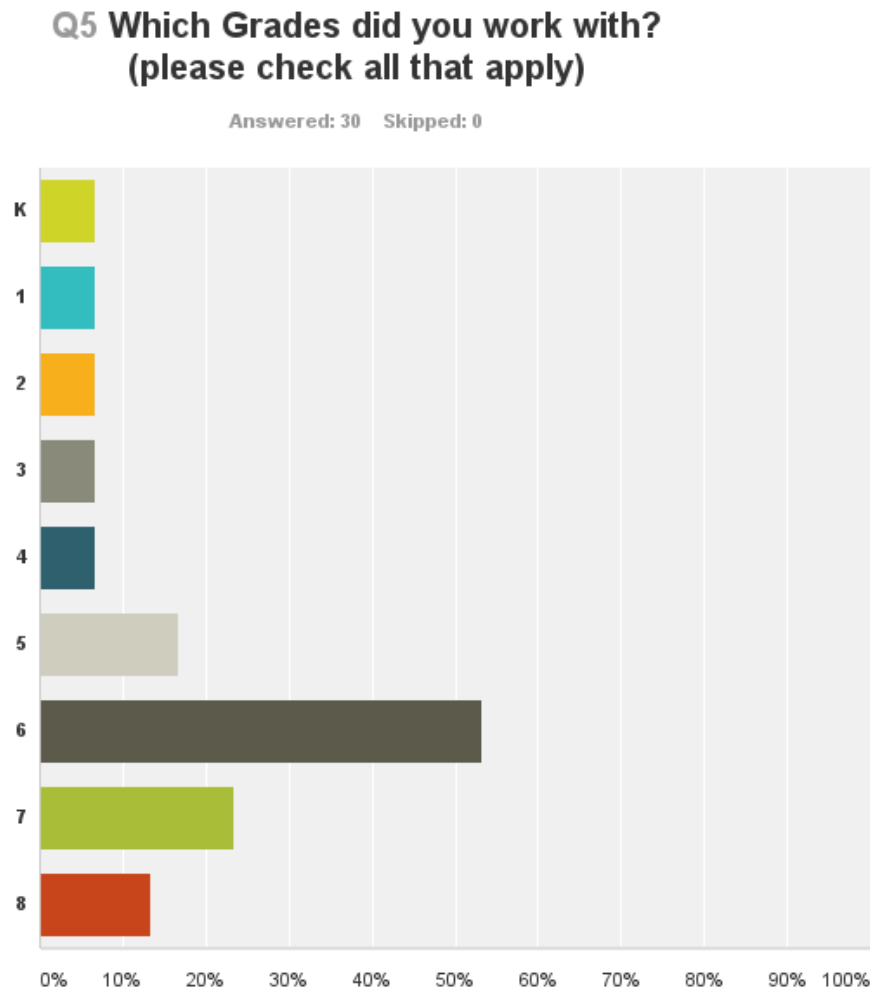
Table 3: Activities

Q6 **Which activity(ies) did you facilitate? (please check all that apply)**

Answered: 30   Skipped: 0

A majority of the respondents (roughly 68%; n=21) were trained in person or by phone by a Smithsonian staff member. In addition, a majority (87%; n=26) of the respondents agreed that the training was well organized and that the main points were well covered and clear. A majority (87%; n=26) also agreed that the facilitator demonstrated comprehensive knowledge of the subject matter and convey ideas effectively and clearly. Ninety percent (n=27) of the respondents felt that the materials were informative and easy to understand. Survey responders reported a slightly lower rating on how the training material could have impacted their professional lives.

When asked about how they would improve the training sessions, roughly 32 percent (n=9) of the respondents said that they would clarify the training objectives. Approximately one-third (29%; n=8) said that more content should be covered in the training sessions. Through open-ended responses about changes to the training, individual respondents reported that 1) the supplies and tools (e.g., fabrics, glue, batteries) in classroom did not match the training, 2)

7

training seemed a little rushed, 3) more information needed to be provided on the topic, 4) participants needed more time to do trial runs themselves and 5) more information on how to engage students was needed.

A smaller number of volunteers responded to open-ended questions related to the training sessions (n=19). Commenting on what they found most valuable about the training sessions, they reported having the training guide as follow up, watching the trainer run through the activity, and in-person and hands-on training as the key factors. In addition, responders reported that they would have benefited more from having the same supplies during the training session and in the classroom, and more information to share with students about the topic the activity covered

Most of the participants said the training guide was well organized (87%; n=25) and covered the main points (87%; n=25). They also agreed that the guide demonstrated comprehensive knowledge of the subject matter (85%: n=24) and conveyed ideas in a clear and effective manner (86%: n=25). Roughly half (54%: n=16) disagreed in the assessment of the guide as providing useable skills for their professional lives. This was not surprising as the guide was for their volunteer work and not for their everyday work.

In the open-ended questions about the training guide, respondents reported that having a written training guide with the activity information, materials and instructions was valuable and that the guide was clear and a good reference tool. When asked what was least valuable about the training guide, respondents reported that they wanted more information (e.g., talking points, facts, or details) about the topic areas covered in the activities. Responses also cited a need for more clarity on using the SLL collections or other websites included in the instructions (such as the 3D animation application) during the activities. One respondent commented that the training guide should have step-by-step instructions with accompanying pictures. Another commented that more details and in-depth information was needed on the topics covered.

Approximately 66 percent (n=19) of the respondents said that they were able to incorporate the SLL collection into their activity. Roughly 50 percent (n=14) of the respondents felt the implementation of the activities went well and seven responders reported that the students were engaged and really enjoyed using the SLL collection. Please note that while the observations only witnessed one use of the SLL collection, the survey includes responses from all three schools where activities were implemented which included other instances of the SLL being used. When asked about constraints to using the SLL, those few that responded reported the lack of computers for each student and time constrains as barriers for using the SLL.

When asked overall what would have made implementation of the activities more successful, respondents reported having: differentiated instructions for each grade level, supplies that match the guide exactly, more information on the topic area for the activity and more time to complete the activity as factors that would have improved students engagement.

Overall recommendations for the training:
- Include more time for participants to practice facilitating students' activities
- Include more information about the topic areas the activities covered
- Match the materials in training and in the classroom

Overall recommendations for the training guide:
- Include more detailed information about the topic areas to share with students
- Include step-by-step instructions
- Include specific information about incorporating the SLL collection in the activity

Conclusion

Overall the Lenovo Week of Service/SCLDA project was successful. Observations and responses from volunteers demonstrated that students were engaged and enjoyed the activities. Overall the volunteers enjoyed participating with the leaders and provided valuable feedback on the training and training guide for the activities. These include more time during the training and more detailed information about the topic areas. This information will be used in the refinement of the training guide.

Appendices

A) Lenovo Event Observation Form

Observer:

Date:

School:

Teacher:

Grade Level:

1 Which activity is the class engaging in?

2 please complete the following scale regarding student engagement during the activity:

Very High (90% or more of the students exhibit this)   High   Medium (approximately 50% of the students exhibit this)   Low   Very Low (10% or less of the students exhibit this)

Positive Body Language ˆ ˆ ˆ ˆ ˆ (Students exhibit body postures that indicate they are paying attention to the teacher and/or other students)

Consistent Focus ˆ ˆ ˆ ˆ ˆ (All students are focused on the learning activity with minimum disruptions)

Verbal Participation ˆ ˆ ˆ ˆ ˆ (Students express thoughtful ideas, reflective answers, and questions relevant or appropriate to learning)

Student Confidence ˆ ˆ ˆ ˆ ˆ (Students exhibit confidence and can initiate and complete a task with limited coaching and can work in a group)

Fun and Excitement ˆ ˆ ˆ ˆ ˆ (Students exhibit interest and enthusiasm and use positive humor)

Overall Level of Student Engagement

3 How did the students use SLL during your visit?

4 Please describe overall student engagement in the classroom as the students are experiencing the LL and engaging in the hands-on activity:

B) Smithsonian Center for Learning & Digital Access Evaluation/ Lenovo Week of Service Event Survey

How would you describe yourself? (please select all that apply):

- Teacher
- Administrator
- Principal
- Librarian
- Parent
- Home School Instructor
- Curriculum Specialist
- Student
- Museum staff
- Interested in a specific topic/subject
- Lenovo employee
- Other (please describe)

What is your home zip code or postal code?

Do you have any experience working in an educational setting with students? YesNo

- Which school did you facilitate at? (check all that apply)Carroll Middle School
- East Millbrook Middle School
- Reaching All Minds Academy

Which Grades did you work with?

- K
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8

Which activity did you facilitate? (check all that apply)

- CURIO Card Game
- 3D Modeling: Bugs
- Botany Field Book Illustration
- Wright Flyer Activity
- ArtBots
- E-Textiles

How were you trained?

- In person by Smithsonian staff
- By phone by Smithsonian staff
- By another leader?
- By another helper?
- Other:

Training

Please rate the following items on a scale from 1 to 5 by circling the appropriate number:

1=Strongly Agree (SD); 2 = Disagree (D); 3 = Not Sure (NS); 4 = Agree (A); 5 = Strongly Agree(SA).

- I felt that the training was well organized
- I felt the main points were well covered and clarified.
- I felt that the facilitator demonstrated comprehensive knowledge of the subject matter.
- The facilitator helped me to understand how the training material related to my own professional life.
- I felt that the facilitator conveyed ideas effectively and clearly
- I felt the material was informative and easy to understand.
- I gained usable skills and will be able to apply them to my professional life.

What was the most valuable aspect of the training?

What is least valuable about this training? 10. How would you improve this training? (Check all that apply.)

- Provide better information before the training
- Clarify the training objectives.
- Reduce the content covered in the training.
- Increase the content covered in the training.
- Improve the instructional methods.
- Make training activities more stimulating.
- Improve training organization.

- Make the training less difficult.
- Make the training more difficult.
- Slow down the pace of the training.
- Speed up the pace of the training.
- Allot more time for the training.
- Shorten the time for the training.
- I wouldn't change anything about this training.

Please elaborate on the answers you selected:

Please share any additional comments or suggestions on the training itself:

Training Guide

Please rate the following items on a scale from 1 to 5 by circling the appropriate number:

1=Strongly Agree (SD); 2 = Disagree (D); 3 = Not Sure (NS); 4 = Agree (A); 5 = Strongly Agree(SA).

- I felt that the training guide was well organized
- I felt the main points were well covered and clarified
- I felt that the training guide demonstrated comprehensive knowledge of the subject matter.
- The training guide material related to my own professional life.
- I felt that training guide conveyed ideas effectively and clearly
- I felt the material was informative and easy to understand.   I gained usable skills from the training guide and will be able to apply them to my professional life.
- What was the most valuable aspect of the training guide?
- What is least valuable about the training guide?

How would you improve the training guide? (Check all that apply.)

- Clarify the training guide objectives.
- Reduce the content covered in the training guide.
- Increase the content covered in the training guide.
- Improve the instructional methods.
- Make training guide activities more stimulating.
- Improve training guide organization.
- Make the training guide less difficult.
- Make the training guide more difficult.
- I wouldn't change anything about the training guide.

Please elaborate on the answers you selected:

Please share any additional comments or suggestions on the training

How well did the implementation of the activities go in your opinion?

1	2	3	4	5
Not well		ok		very well

Were you able to incorporate the Learning Lab collection into your activity? Yes No

If yes, how did the students respond to the Learning Lab portion of the activities?

If no, what constraints did you face that that made it too difficult for you to use?

Is there anything that would have made the implementation of the activities more successful?

Thank you!