



Best Practices for Field Days

2008 Children's Water Festival Evaluation: Presentation Skills for 29 Learning Stations

September 2008

Authors: *Stephan P. Carlson and Hui-Hui Wang*

Copyright © 2009 Regents of the University of Minnesota. All rights reserved

Twenty-nine stations were observed by sixteen observers. Because the research studies could not control how many times that a station was observed, some of the stations were observed only once, while other stations were observed more than once. The station, "*Water! Science Museum*" was observed the most frequently, a total of sixteen times by sixteen different observers. The stations observed once by the sixteen observers are: "*Well, Well, Well*", "*Disappearing Waterfall Mystery*", "*Streams Creatures*", "*Lakes & Rivers & Oceans-Oh my*", "*Backyard Water Recycling*", and "*Groundwater on the Move*." The following stations were not observed at all: "*Water! Water! From the River to the River*" and "*Water Arcade*."

We categorized observers' individual field day assessment tool into four parts; introduction skills, presentation skills, question asking skills, and summary of lesson skills.

Introduction skills incorporated the following 5 parts:

- a) welcomed participants positively,
- b) introduced self clearly,
- c) stated upcoming activities clearly,
- d) asked questions that revealed participants' knowledge,
- e) provided a clear advance organizer.

Presentation skills incorporated 7 parts which include:

- f) gave equal attention to all participants,
- g) kept nearly all participants focused on activities most of the time,
- h) used appropriate language,
- i) checked on participant understanding,,
- j) provided clear instructions when necessary,
- k) demonstrated enthusiastic/engaging behavior throughout,
- l) was seen and heard by all participants nearly all the time.

Question asking skills included these 4 parts:

- m) used questions that allowed participants to voice what they already knew or just learned,
- n) used questions that challenged participants to apply knowledge to new situations and/or made them think critically about an issue,
- o) waited 3+ seconds after asking questions before calling on participants,
- p) allowed participant questions to influence the direction of the learning experience.

Summary of lesson skills included the following 4 parts:

- q) described how the station topic connected to the overall field day theme,
- r) described a link or connection to other stations in the field day,
- s) described the relationship between the station's objectives and the lives of participants,
- t) summarized the key points of the presentation.

Based on the results, the total means of the presenter skills were between 2.30 to 2.43. Therefore, the overall performance of twenty-nine stations did not show much difference (Figure 1). However, each station did show strengths and weaknesses during their presentation (Table 1, pg. 19). For example, the stations *Well, Well, Well* and *Backyard Water Recycling* had the lowest performance in introduction skills ($\mu = 1.60$). However, the stations *Disappearing Waterfall Mystery* and *MN-10,000 Lakes and 10 Million Fish* had the highest performance in introduction skills ($\mu = 3.00$). The station *Blue Thumb* showed the lowest performance in the presentation skills ($\mu = 2.43$). On the other hand, the stations *Disappearing Waterfall Mystery*, *The Water Beneath Our Feet*, *Water Pollution on Trial* and *Groundwater on the move* had the highest performance in presentation skills ($\mu = 3.00$). The station *Lakes & Rivers & Oceans-Oh my!* had the lowest performance in question asking skills ($\mu = 1.50$). Yet, the stations *Disappearing Waterfall Mystery* and *Groundwater on the Move* had the highest performance in question asking skills ($\mu = 3.00$). In the lesson summary skills, stations *Well, Well, Well*, *Aquatic Macro invertebrates* and *Blue Thumb* had the lowest performance ($\mu = 1.30$). However, the station *Why Do Rivers Change* had the highest performance in lesson summary skills ($\mu = 2.60$).

In each category of presenter skills, the lesson summary skills had lowest performance ($\mu = 1.96$), and presentation skills had highest performance ($\mu = 2.71$). This indicated that presenters in each station needs to improve their presentation skills in connecting their presentation to the overall field day theme, other stations and audience's daily life. Also, presenters in each station need to have a stronger summary of the key points in their presentation coming during the end of their presentation.

Comments from Observers

Some stations had comments from observers, but most did not. One interesting comment showed that the environment was too loud and both kids and presenters had a hard time focusing on the presentation. These stations were set up in an indoor setting. Therefore, the comments pointed out that an indoor setting was not an ideal place to have the presentation. Other comments related to either individual presenter's presentation skills or the teaching facilities that the instructors used and how it could be improved.

Each graph compared the mean difference in each category of presenter skills from the 29 stations. We used the overall mean of presenter skills in each category from the 29 stations as a standard to evaluate the performance of the presenter skills in each station. The comparison between the presenter skills of each station with the overall presenter skills were shown by percentage. For example, the introduction skills of station A, *Well, Well, Well*, showed 34% below the overall means. In other words, station, "A" needs to improve on introduction skills, because it was 34% below the average of all 29 stations' performance in introduction skills.

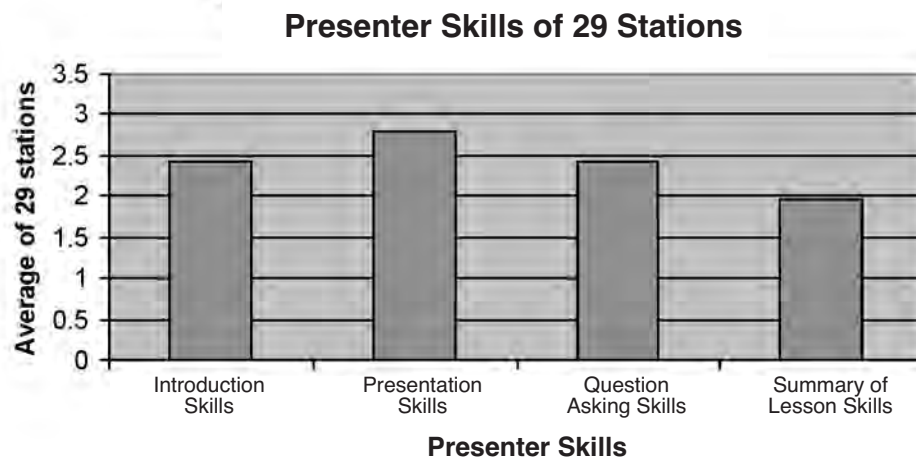


Figure 1. Overall assessment shows that presentation skills were high ($\mu = 2.8$) while introduction and questioning skills were lower ($\mu = 2.4$) and the conclusions were the weakest presenter skills ($\mu = 1.96$). This would suggest the conclusions or endings were not as clear as the rest of the presentations. The assessments of individual stations **A – Z** follow, with comments.

Well, Well, Well

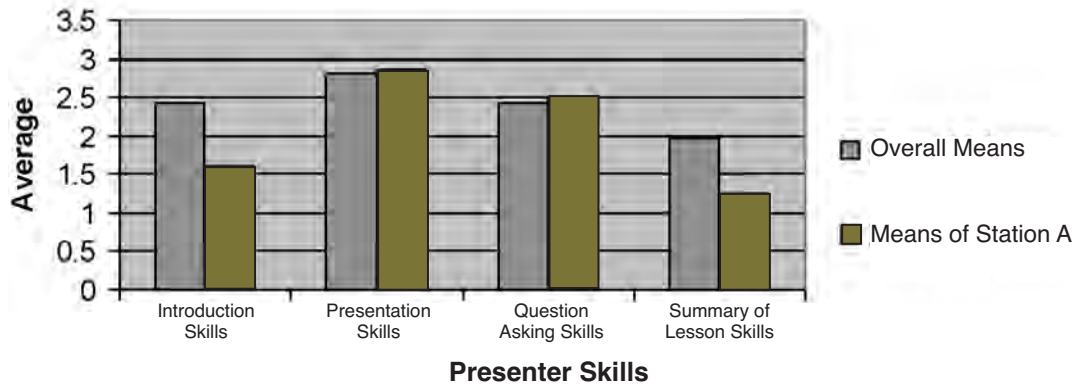


Figure A. This station had only one observer but the data does show that the summary or conclusion (32 % below the mean) was weak along with the introduction (34 % below the mean). The presenter asked questions (3 % above the mean) and did well at presentation skills (2% above the mean).

*Comments for the station, *Well, Well, Well*: None

Aquatic Macroinvertebrates

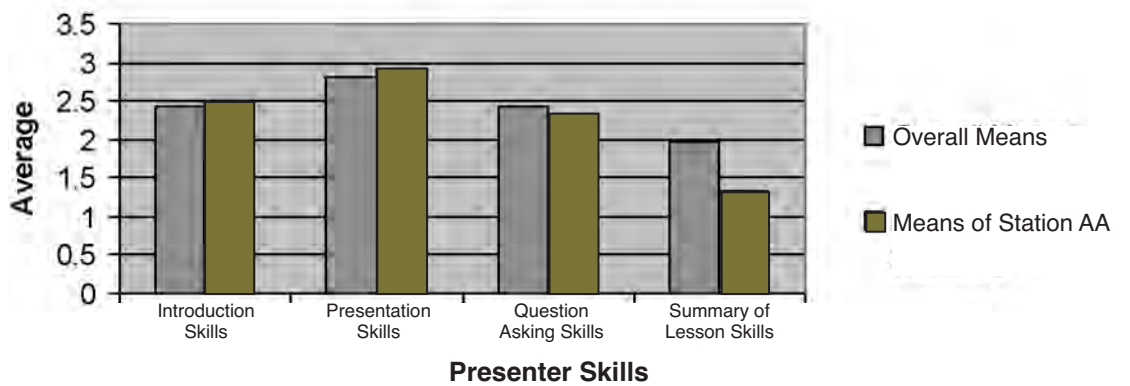


Figure AA. This site had 3 observers and the data shows that the summary was weakest part of the presentation (32% below the mean).

* Comments for the station, *Aquatic Macro-invertebrates*: Very soft spoken presenter for a noisy environment. She should have repeated answers back for all to hear.

Disappearing Waterfall Mystery

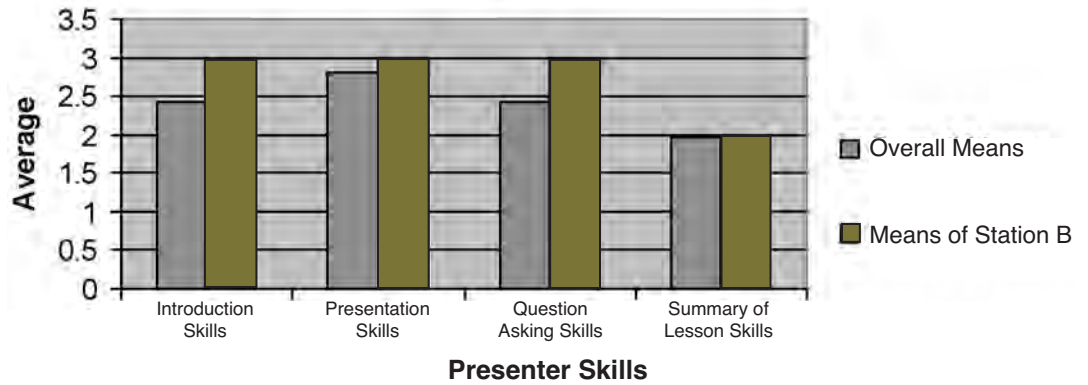


Figure B. This station had one observer and the data suggest that overall it went well. Again there is a decline in the summary part of the lesson, yet, it was still 2 % above the mean.

*Comments for the station, *Disappearing Waterfall Mystery*: None

The House that Jack Built

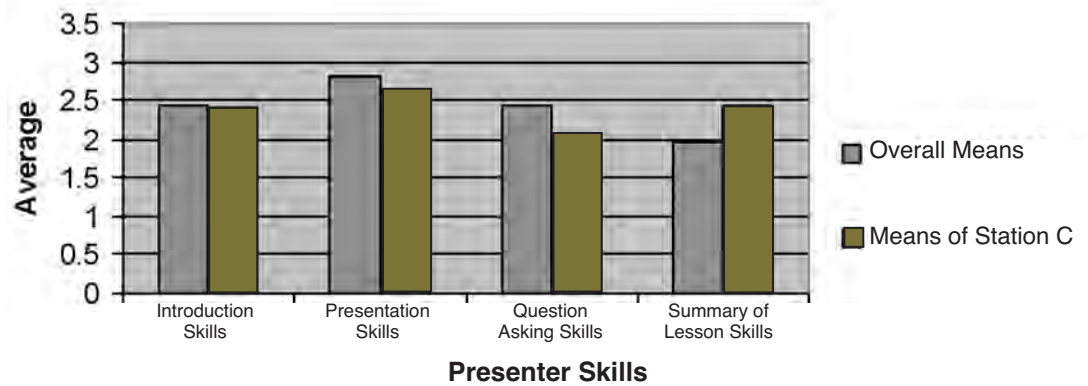


Figure C. This station had 3 observers and the data suggest that all areas did well. Asking questions were the weakest part (14.2% below the mean) but overall it was a very strong presentation.

*Comments for the station, *The House that Jack Built*: (1.) The presenter only looked at kids that in front of him; (2.) Used some terms without defining them.

FLUSH! The Waste Water Story

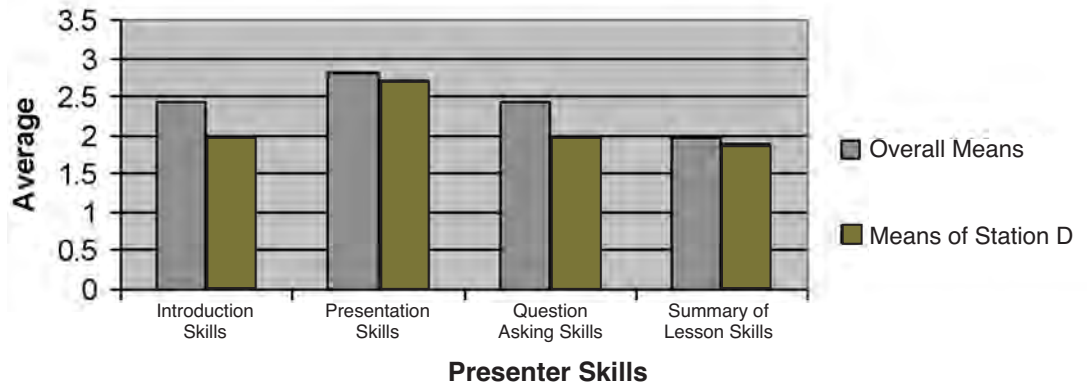


Figure D. This site had 2 observers and the data suggest that the summary was the weakest (3.3% below the mean). Presentation skills were good, yet, 3.3% below the mean. Even though introduction skills were the highest point, it was 17.3% below the mean.

*Comments for the station *Flush! The Waste Water Story*: 1) Presenter seemed rushed to cram a lot of information into a short amount of time; 2) Lecture, but with student involvement.

Streams and Wetlands

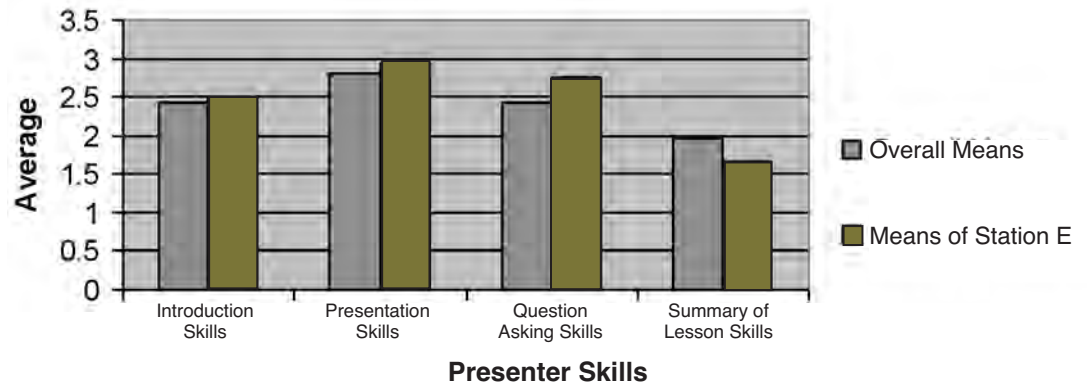


Figure E. This presentation was viewed by 3 observers and the data suggest that all went well except the summary or conclusion (14.1% below the mean)

*Comments for the station, *Streams and Wetlands*: The presenter recalled what 4 things make up a stream.

The Watershed!

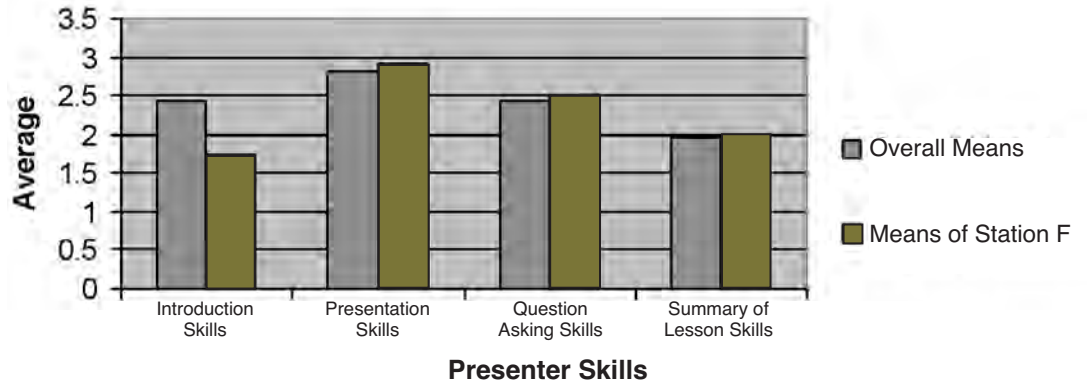


Figure F. This presentation was viewed by 3 observers who found that the introduction was the weakest part of the presentation (28.4% below the mean).

*Comments for the station, *The Watershed*: 1) Although presenter used a demo, she didn't allow students to participate, ask questions, or answer questions. She only delivered information; 2) Presenter forgot what station she was and sent class away.

Streams Creatures

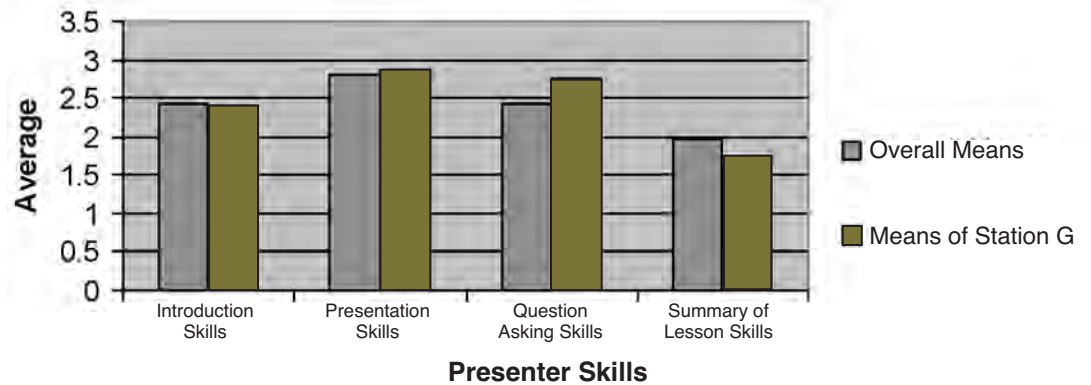


Figure G. This station had one observer and the data suggest that the summary was the weakest part of the presentation (10% below the mean).

*Comments for the station *Streams Creatures*: None

Just Passing Through

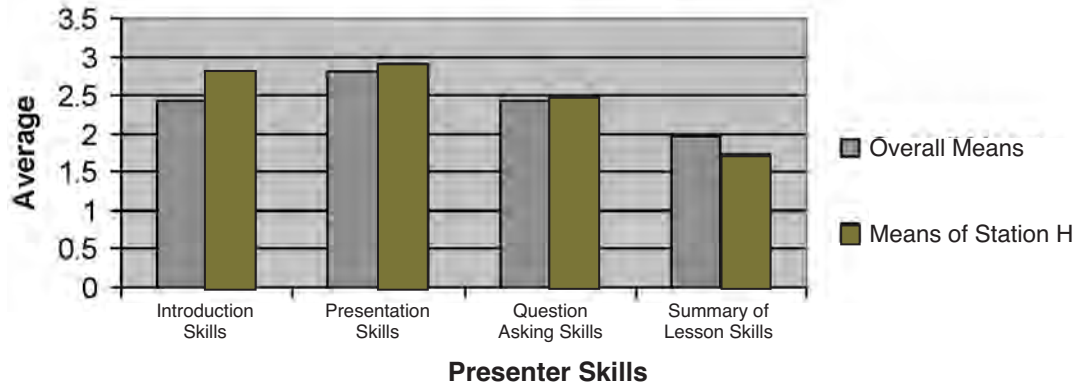


Figure H. This station had 3 observers and the data suggest that the summary or conclusion was the weakest part of the presentation (10% below the mean)

*Comments for the station, *Just Passing Through*: Presenter used example relate to student’s daily life and student choices influenced condition of the river.

The Water Beneath Our Feet

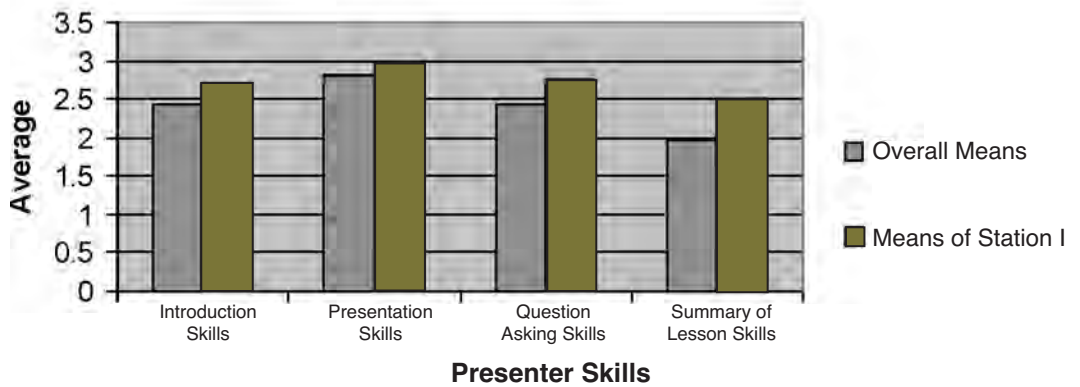


Figure I. This station had 2 observers and the data suggest that all areas did well. All the presentation skills were above the mean. Summary of lesson skills was the weakest of the four areas, yet, it was still 28.5% above the mean. Therefore, overall this station has a strong presentation.

*Comments for the station, *The Water Beneath Our Feet*: None

Lakes & Rivers & Oceans-Oh my!

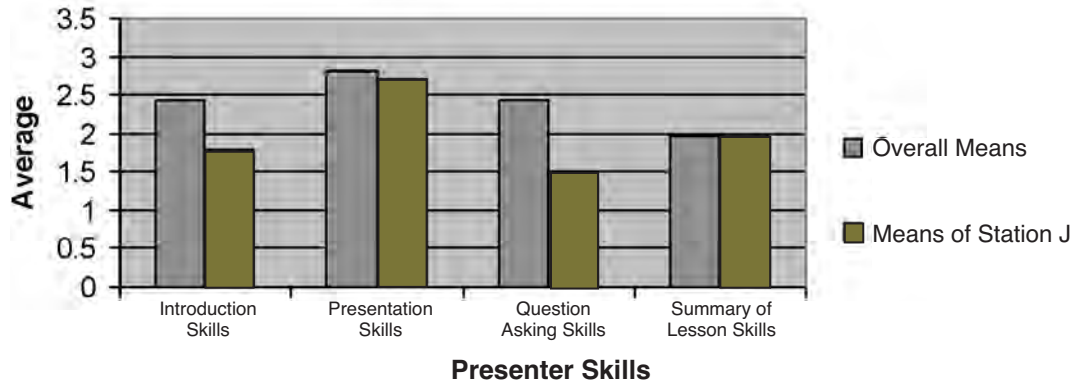


Figure J. This station had only 1 observer. Although the data suggest the presenter had good presentation skills, it was 3% below the mean. The data suggests that the “question asking skills”, were the weakest part of the presentation and it was 38.1% below the mean.

*Comments for the station, *Lakes & Rivers & Oceans-Oh My!*: Presenter should have repeated answers to questions back to the group.

Backyard Water Recycling

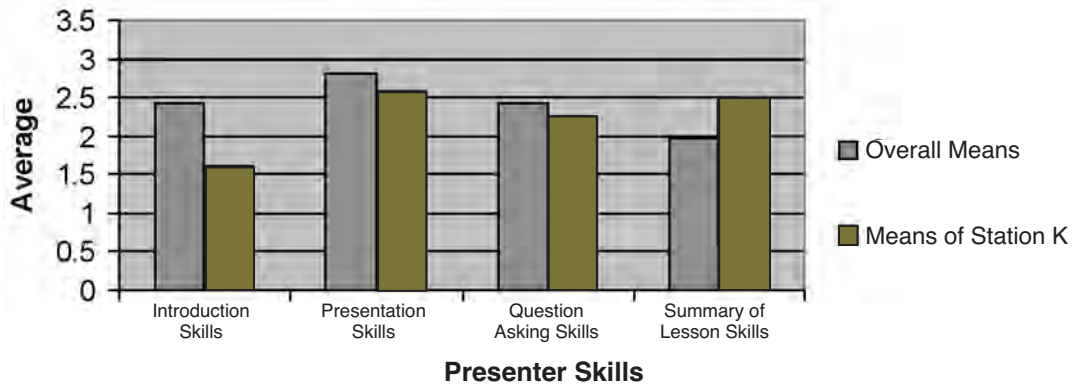


Figure K. This station was viewed by only 1 observer. Although the data suggest this station had strong presentation skills, it was 8% below the mean. However, the summary of lesson skills was 28.5% above the mean. The data also suggest that the weakest part of the presentation was the introduction skills and it was 33.8% below the mean.

*Comments for the station, *Backyard Water Recycling*: None.

A Model Stream

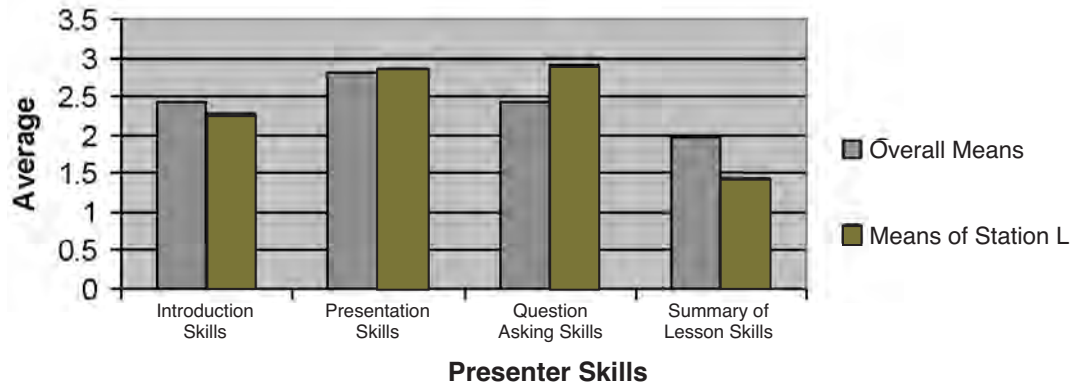


Figure L. This station had 3 observers. The data suggest that the summary or conclusion was the weakest part of the presentation and it was 27% below the mean. Question asking skills was the strongest performance and it was 21% above the mean.

* Comments for the station, *A Model Stream*: None

Why Do Rivers Change

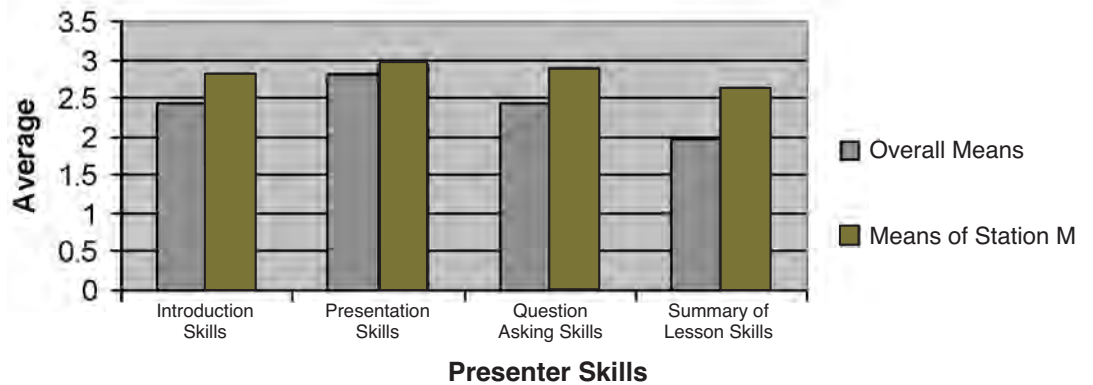


Figure M. This station had 2 observers and the data suggest that all areas did well. Even though the summary of lesson skills was the weakest part of the presentation, it was 35% above the mean. Overall this station was a strong presentation.

*Comments for the station, *Why Do Rivers Change*: None

Blue Thumb

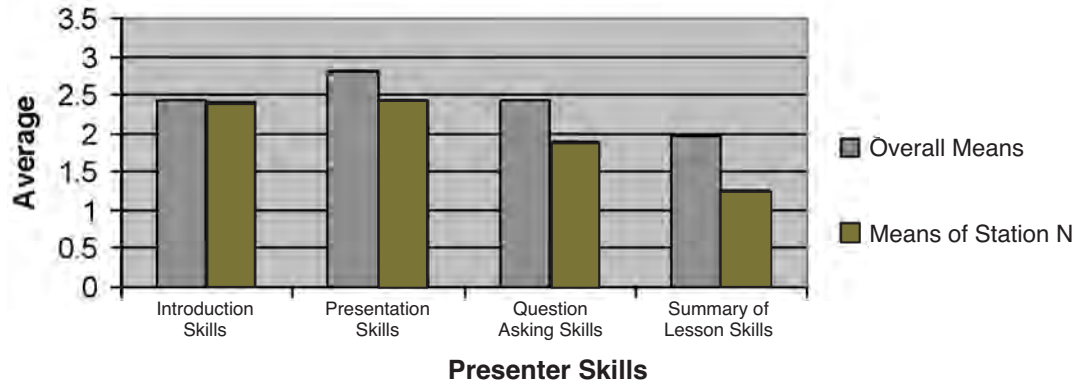


Figure N. This station had 2 observers and the data suggest that the presenter showed average introduction (0.7% below the mean) and presentation skills (13% below the mean). Furthermore, questioning asking skills (22% below the mean) and the summary of lesson skills (35% below the mean) did not really show in the presentation. Overall, this station needs a lot of improvement.

*Comments for the station, *Blue Thumb*: No clear wrap up.

Understanding Water Quality

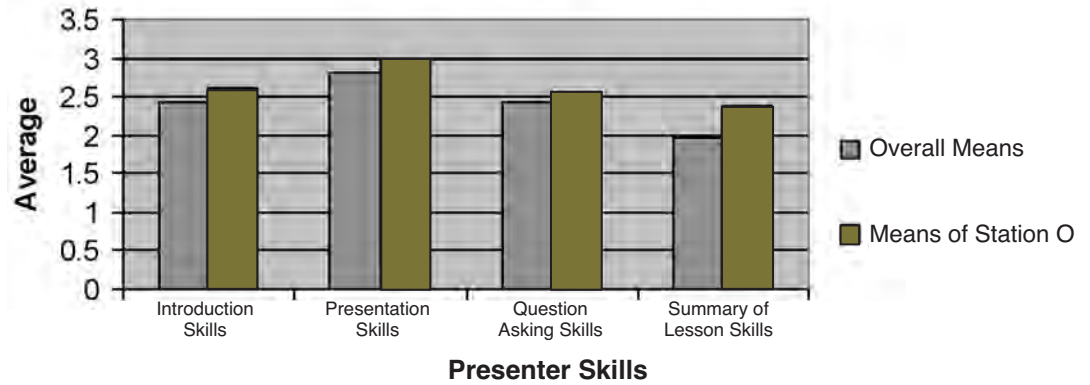


Figure O. This station had 4 observers. The data suggest that all areas did well. Even though the summary of lesson skills was the weakest part of the presentation, it was 22% above the mean. Over all it was a strong presentation.

*Comments for the station, *Understanding Water Quality*: 1) Theme of station was refaced; 2) One part of Demo was difficult to see.

Adopt A River Crime Lab

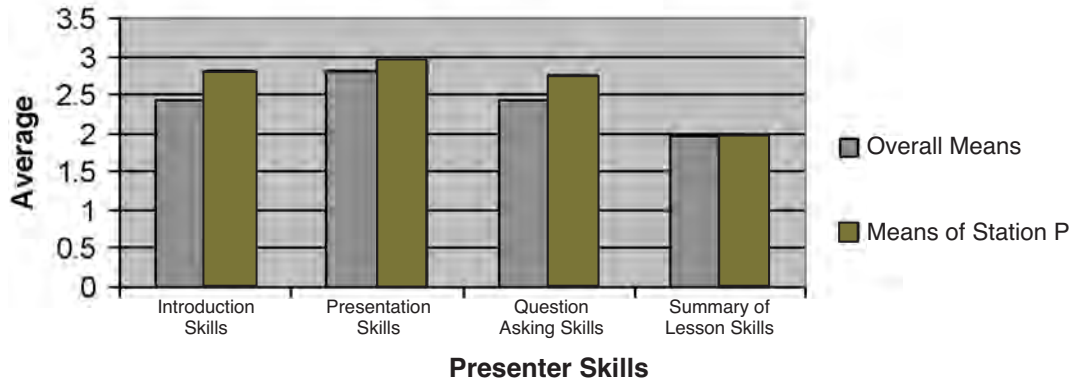


Figure P. This station had 2 observers and the data suggest that the summary or conclusion was the weakest part of the presentation. However, it was 2.8% above the mean. Overall, it was a strong presentation..

*Comments for the station, *Adopt A River Crime Lab*: Very good presenter. Message was clear.

Secret Insides of Fishes

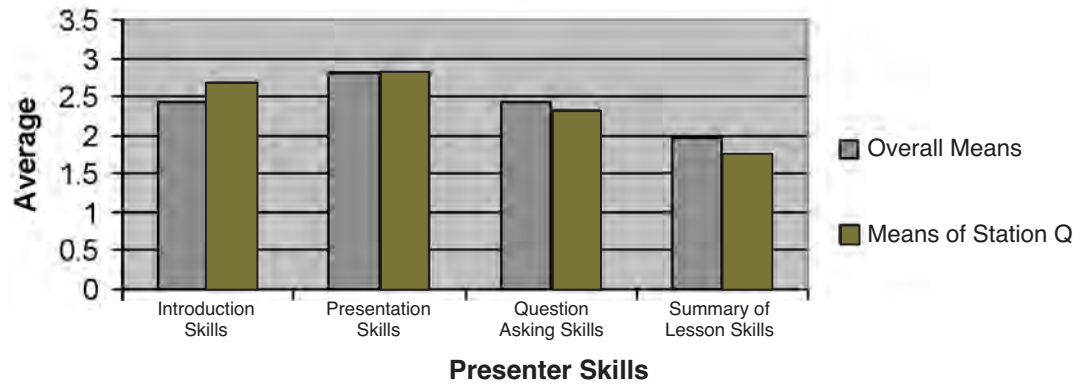


Figure Q. This station had 3 observers. The data suggest that both introduction skills (10% above the mean) and presentation skill (equal to mean) did well. However, summary of lesson skills was the weakest part of the presentation, and it was 10% below the mean.

*Comments for the station, *Secret Insides of Fishes*: None

Watch It Rain!

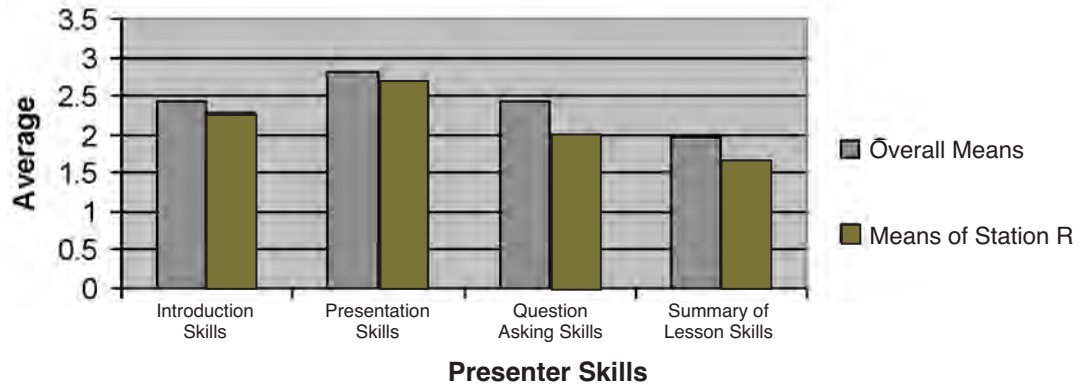


Figure R. This station had 3 observers. The data suggest presentation skills were the strongest part. However, in this station, the presentation skills were 5% below the mean. On the other hand, summary of lesson skills was the weakest part of the presentation, and it was 14% below the mean.

*Comments for the station, *Watch It Rain*: None

MN-10,000 Lakes and 10 Million Fish

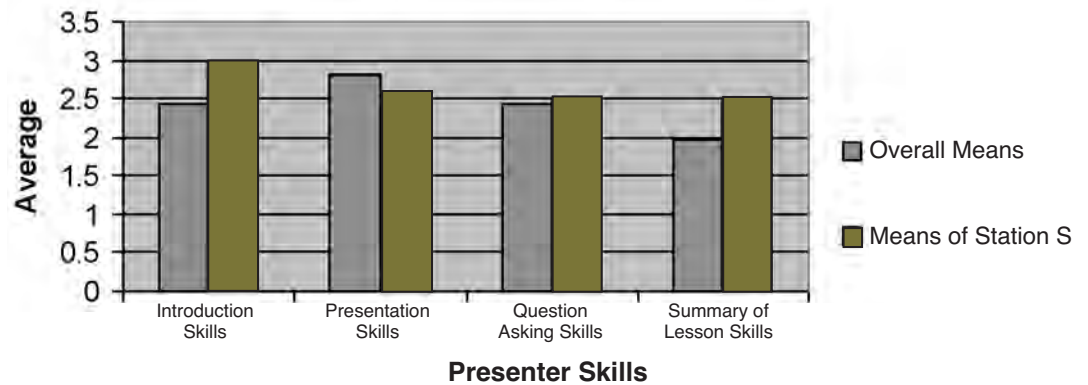


Figure S. This station had 2 observers. The data suggest introduction skills were the strongest part and it was 24% above the mean. On the other hand, question asking skills (3% above the mean) and summary of lesson (29% above the mean) had good performances, too. However, presentation skills were 8% below the mean.

*Comments for the station, *MN-10,000 Lakes and 10 Million Fish*: 1) Primarily a lecture; 2) Kids really difficult to focus after science museum.

Singing Rivers/ Water & Weather

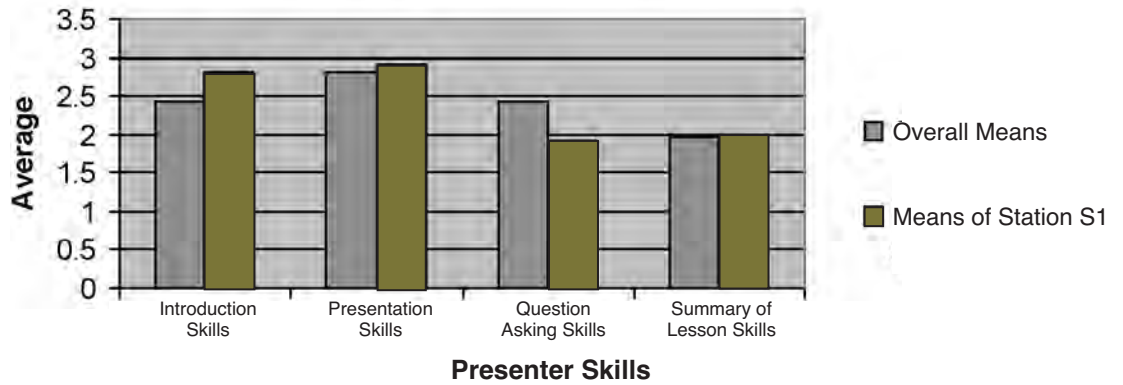


Figure S1. This station had 3 observers. The data suggest that presentation skill was the strongest part. It was 4% above the mean. On the other hand, question asking skills (20% below the mean) and summary of lesson (2% above the mean) were the weakest parts.

*Comments for the station, *Singing Rivers/Water & Weather*: 1) (Singing Rivers) the song language was much more age appropriate than the lecture; 2) (Singing Rivers) sometimes used words that could be explained; 3) (Singing Rivers) Great job! Kids seemed to really get into it!

Water! Science Museum

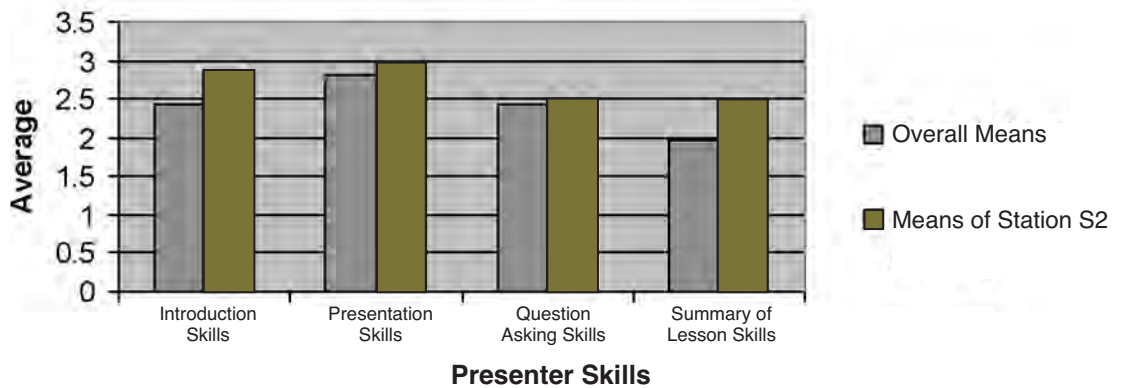


Figure S2. This station had 16 observers. The data suggest that all areas did well. Even though both question asking skill (3% above the mean) and summary of lesson skills (27% above the mean) had rooms to be improved, these two skills actually still had the average above the mean. Overall this station was a strong presentation.

*Comments for the station, *Water! Science Museum*: 1) Presenter is very animated and enthusiastic; 2) Excellent, engaging!; 3) Large group presentation, did not allow much audience influence in presented materials; 4) Great speaker and fun, too; 5) Wonderful!

Down the Dirty Drain

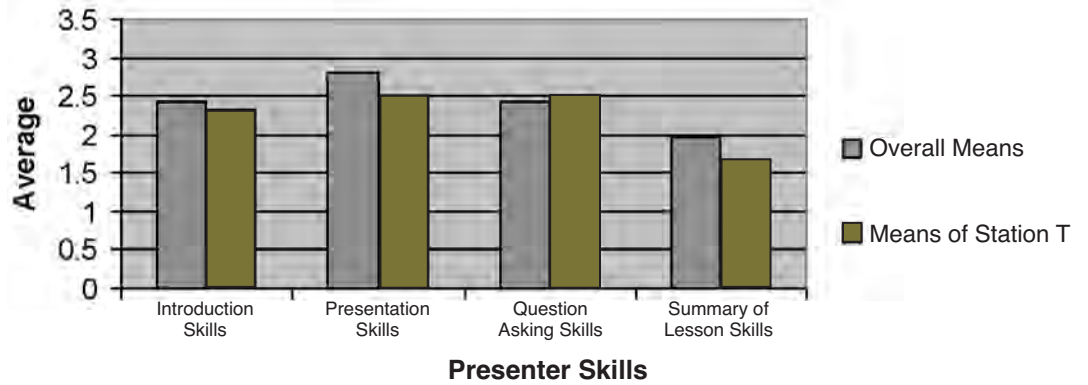


Figure T. This station had 5 observers. The data suggest that introduction skills (4% below the mean), presentation skills (1% below the mean), and summary of lesson skills (15% below the mean) had some rooms for improvement.

*Comments for the station, *Down the Dirty Drain*: 1) Could have summarized better to pull the presentation together; 2) O.K Presentation; 3) Prop map was 11 X17, but it was black and white, it was hard to see it.

Water Pollution on Trial

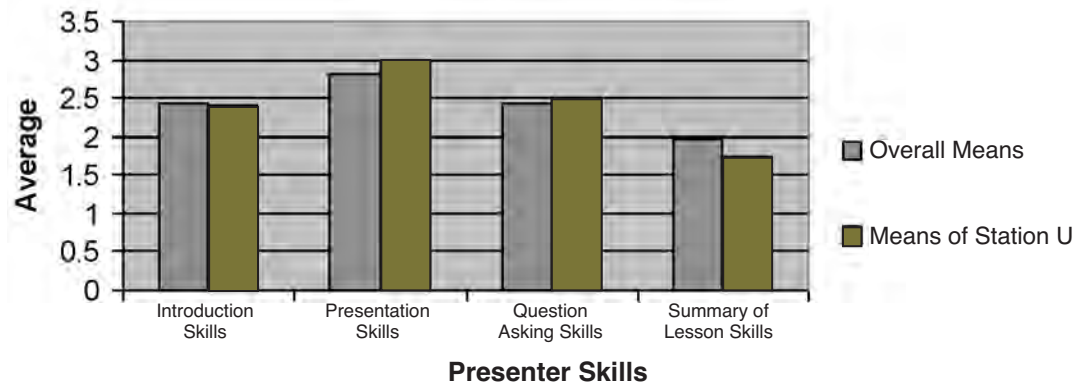


Figure U. This station had 2 observers. The data suggest the presenter showed very strong presentation skills (7% above the mean), but very weak summary of lesson skills (10% below the mean).

*Comments for the station, *Water Pollution on Trial*: Can hear noises from other group's kids.

Clancy, Mercury Sniffing Dog

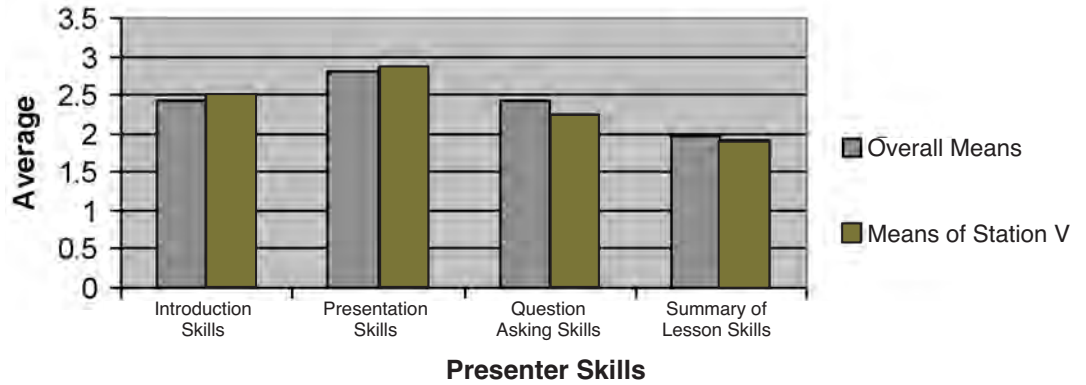


Figure V. This station had 3 observers. The data suggest presentation skills were the strongest part (2% above the mean), but summary of lesson skills was the weakest part of the presentation (1% below the mean). Over all this station had average performance in each presenter skill.

*Comments for the station, *Clancy, Mercury Sniffing Dog*: Location was very breezy and everyone was cold. Also the location was too light to clearly see slides on the wall.

Catch a Wave!

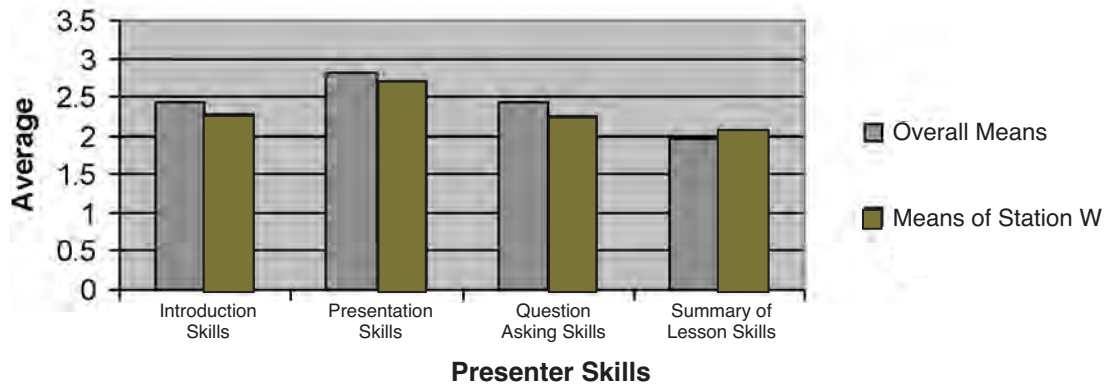


Figure W. This station had 3 observers. The data suggest that this station showed an average performance in the four part of presentation skills. The lowest presenter skills which below the mean were introduction and summary of lesson skills (6% below the mean)

*Comments for the station, *Catch a Wave*: Used wave machine to demonstrate concepts.

BuZZZ! Mosquitoes

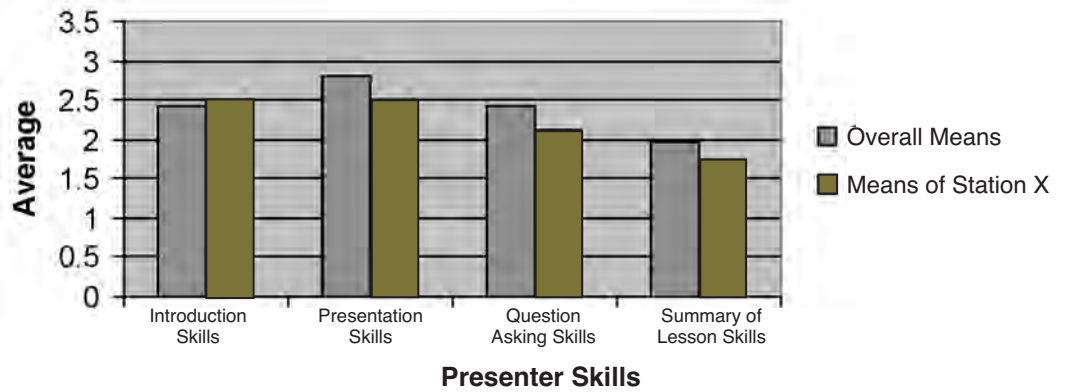


Figure X. This station had 2 observers. The data suggest both question asking skills (12% below the mean) and summary of lesson skills (10% below the mean) had rooms to be improved.

*Comments for the station, *BuZZZ! Mosquitoes*: The environment was so loud that kids had a hard time focusing.

Water Jeopardy

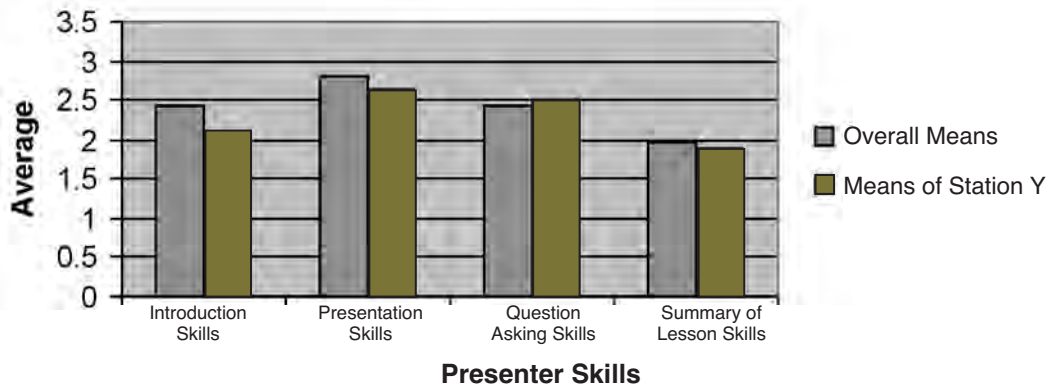


Figure Y. This station had 2 observers. The data suggest even though presentation skill was the strongest part, it was 6% below the mean. On the other hand, summary of lesson skills was the weakest part of the presentation and it was 33% below the mean.

*Comments for the station, *Water Jeopardy*: Small group discussion to make educated guesses about the answer.

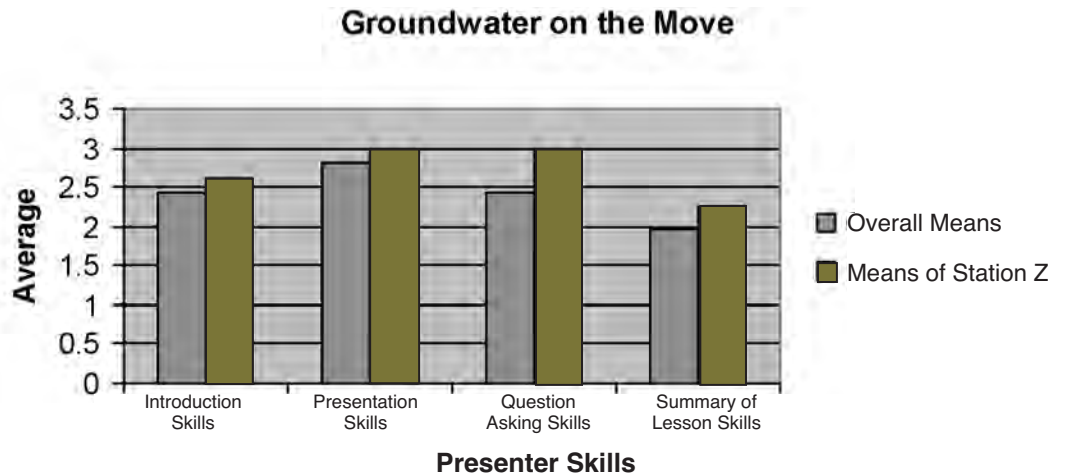


Figure Z. This station had only 1 observer. The data suggest presenter had perfect performance in both presentation skills (7% above the mean) and question asking skills (23% above the mean). Although, summary of lesson skills was the lowest performance, it still had 15% above the mean.

*Comments for the station, *Groundwater on the Move*: Music from the stage was way too loud.

Audience Engagement

A comparison was made between audience engagement and teaching strategies employed by the presenter (Figure 2). The results were not significant but it does seem to indicate that lecture seemed to have less engaged students. The challenge with the data is that some presentations had multiple delivery methods so more than one method was checked on the observation sheet.

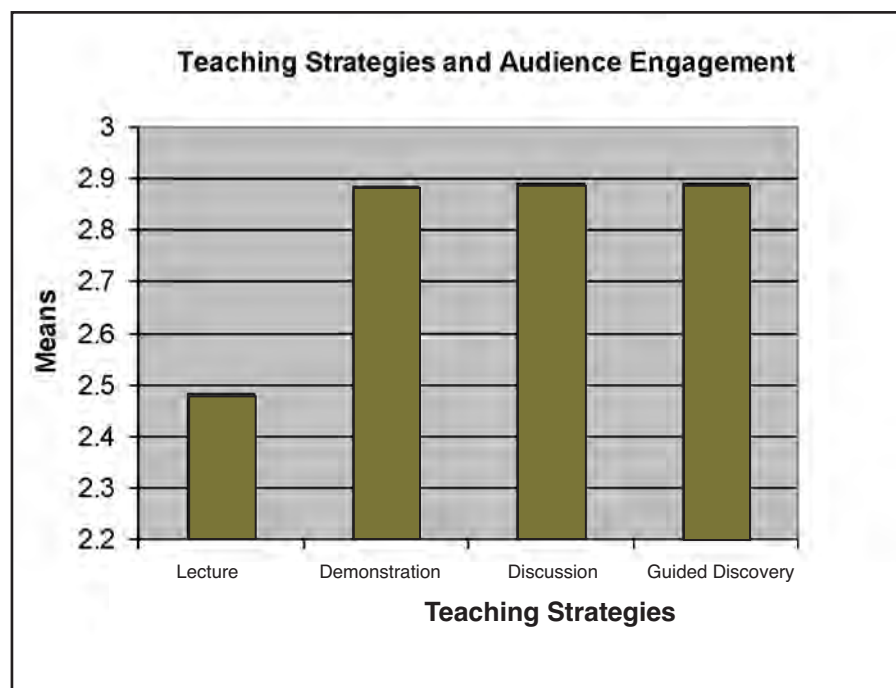


Figure 2. Compares audience engagement and teaching strategies employed by presenters.

Final Thoughts

In conclusion, this assessment gives concrete ideas on how and where changes may be made to the overall program. Added to the other piece it seems to support the notion that parts of the objects were not met (how to clean water and celibate cultures). The two studies support the enjoyment and satisfaction factors that have been shown to have a strong influence on learning. Also, the assessment suggests places where one can provide comments to presenters on where they could make improvements. Additional breakdowns for each presentation are also available if that would be helpful for planning of future programs.

In terms of research it reinforces the notion that lectures maybe less engaging and that there is no correlation between being out of school and student enjoyment (other study).

Stephan P. Carlson, Ph.D.

Professor
Environmental Science Education
University of Minnesota Extension

Hui-Hui Wang

Ph.D. Candidate
Department of Curriculum and Instruction
College of Education and Human Development
University of Minnesota

www.extension.umn.edu/fielddays/

University of Minnesota Extension is an equal opportunity educator and employer.

Table 1: Presenter Skills for Each Station:

Station Name	Station ID	Number of Observations	Introduction Skills	Presentation Skills	Question Asking Skills	Summary of Lesson Skills	Means of Total Presenter Skills
Well, Well, Well	A	1	1.6	2.86	2.5	1.3	2.39
Aquatic Macro-invertebrates	AA	3	2.47	2.9	2.33	1.3	2.42
Disappearing Waterfall Mystery	B	1	3	3	3	2	2.42
The House that Jack Built	C	3	2.4	2.62	2.08	2.4	2.41
FLUSH! The Waste Water Story	D	2	2	2.72	2	1.9	2.41
Streams and Wetlands	E	3	2.47	2.95	2.75	1.7	2.41
The Watershed!	F	3	1.73	2.9	2.5	2	2.40
Streams Creatures	G	1	2.4	2.86	2.75	1.8	2.40
Just Passing Through	H	3	2.8	2.9	2.5	1.8	2.42
The Water Beneath Our Feet	I	2	2.7	3	2.75	2.5	2.41
Lakes & Rivers & Oceans-Oh my!	J	1	1.8	2.71	1.5	2	2.40
Backyard Water Recycling	K	1	1.6	2.57	2.25	2.5	2.42
A Model Stream	L	3	2.27	2.86	2.92	1.4	2.43
Why Do Rivers Change?	M	2	2.8	2.93	2.88	2.6	2.43
Blue Thumb	N	2	2.4	2.43	1.88	1.3	2.38
Understanding Water Quality	O	4	2.6	2.96	2.56	2.4	2.41
Adopt A River Crime Lab	P	2	2.8	2.93	2.75	2	2.4
Secret Insides of Fishes	Q	3	2.67	2.81	2.33	1.8	2.36
Watch It Rain!	R	3	2.27	2.67	2	1.7	2.36
MN-10,000 Lakes and 10 Million Fish	S	2	3	2.57	2.5	2.5	2.35
Singing Rivers/ Water & Weather	S1	3	2.8	2.9	1.92	2	2.33
Water! Science Museum	S2	16	2.86	2.96	2.5	2.5	2.32
Down the Dirty Drain	T	5	2.32	2.51	2.5	1.7	2.30
Water Pollution on Trial	U	2	2.4	3	2.5	1.8	2.33
Clancy, Mercury Sniffing Dog	V	3	2.47	2.86	2.25	1.9	2.32
Catch a Wave!	W	3	2.27	2.71	2.25	2.1	2.32
Buzz! Mosquitoes	X	2	2.5	2.5	2.13	1.8	2.32
Water Jeopardy	Y	2	2.1	2.64	2.5	1.9	2.33
Groundwater on the Move	Z	1	2.6	3	3	2.3	2.34
Average of each category			2.42	2.8	2.42	1.96	2.38