

2009

“FETCH!” Online Training Evaluation Report: Executive Summary



Prepared by:

Veridian inSight, LLC,

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Study Goals

Veridian inSight, LLC performed an evaluation study in fall of 2009 on behalf of WGBH to evaluate the effectiveness of an online training developed as an outreach component of the *FETCH! with Ruff Ruffman* series (<http://pbskids.org/fetch/>). The FETCH! Hands-On Science Training was designed for anyone who wants to lead science activities with elementary-age kids (including after-school providers, teachers, camp counselors, librarians, museum staff, parents, and others). Using a combination of text, slideshows, printable handouts, self-evaluations, and a journal to record participants' reflections, the one-hour training aims to help leaders incorporate inquiry strategies into the science activities they lead with kids. The training also strongly encourages participants to practice what they've learned by choosing from a selection of FETCH! activities and leading them with the kids they serve. By comparing their pre- and post-training self-evaluations, participants are able to track their progress and identify areas where they might want to spend more time so as to increase their proficiency in leading science activities.



Figure 1. Home page of the FETCH! training website.

The goals of the evaluation study were to assess the extent to which the FETCH! training was successful at:

- Preparing afterschool educators (hereafter referred to as “leaders”) for leading hands-on science activities;
- Enhancing leaders’ comfort in leading hands-on science activities;
- Helping leaders teach kids about specific science content knowledge and skills (e.g., making predictions, understanding real-world connections); and
- Helping leaders get kids excited and engaged in hands-on science activities.

Study Design

The study design was experimental. We used random assignment in the treatment-control group, pre- and post-test design. The study design is illustrated below:

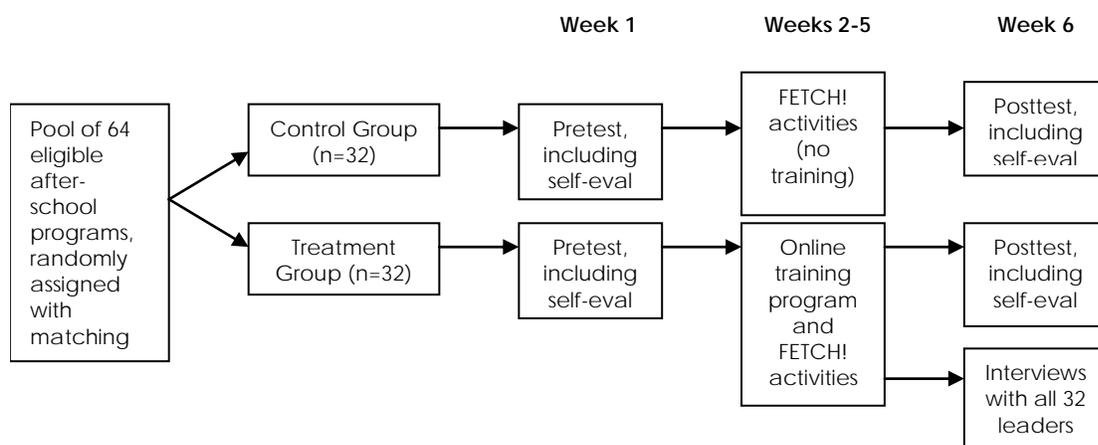


Figure 2. Longitudinal, pre- and post-test, control and treatment group design.

As illustrated in Figure 2, after completing an online pre-test survey, including the self-evaluation tool (Week 1), leaders in the treatment group participated in the FETCH! training and subsequently led two hands-on FETCH! activities over the course of 1-3 weeks. Meanwhile, leaders in the control group did not participate in the training module; they simply led the same two hands-on FETCH! activities that the treatment group used. Next, both groups completed a post-test survey, which included the same questions as the pre-test survey (including the self-evaluation tool). In addition, the post-test survey included an additional section to assess the leaders’ satisfaction and experience with the science activities (both treatment and control). Finally, all 32 treatment group leaders participated in an in-depth telephone interview following the completion of their post-test surveys so that we could gather more detailed feedback on their experience with the FETCH! training.

Participants

To recruit participants for the study, WGBH sent notices about the study to national-level contacts at organizations such as the National Afterschool Association, Girl Scouts, and the Boys & Girls Club, and library associations. Programs that were interested in participating in the study were screened for eligibility. Over 250 programs expressed interest in the study.

Programs were selected into the study in order to maximize diversity across geographic regions, urbanicity, aggregate income level of the program participants, and race/ethnicity distribution of the program participants. Figure 3 illustrates the geographic diversity of the sample.

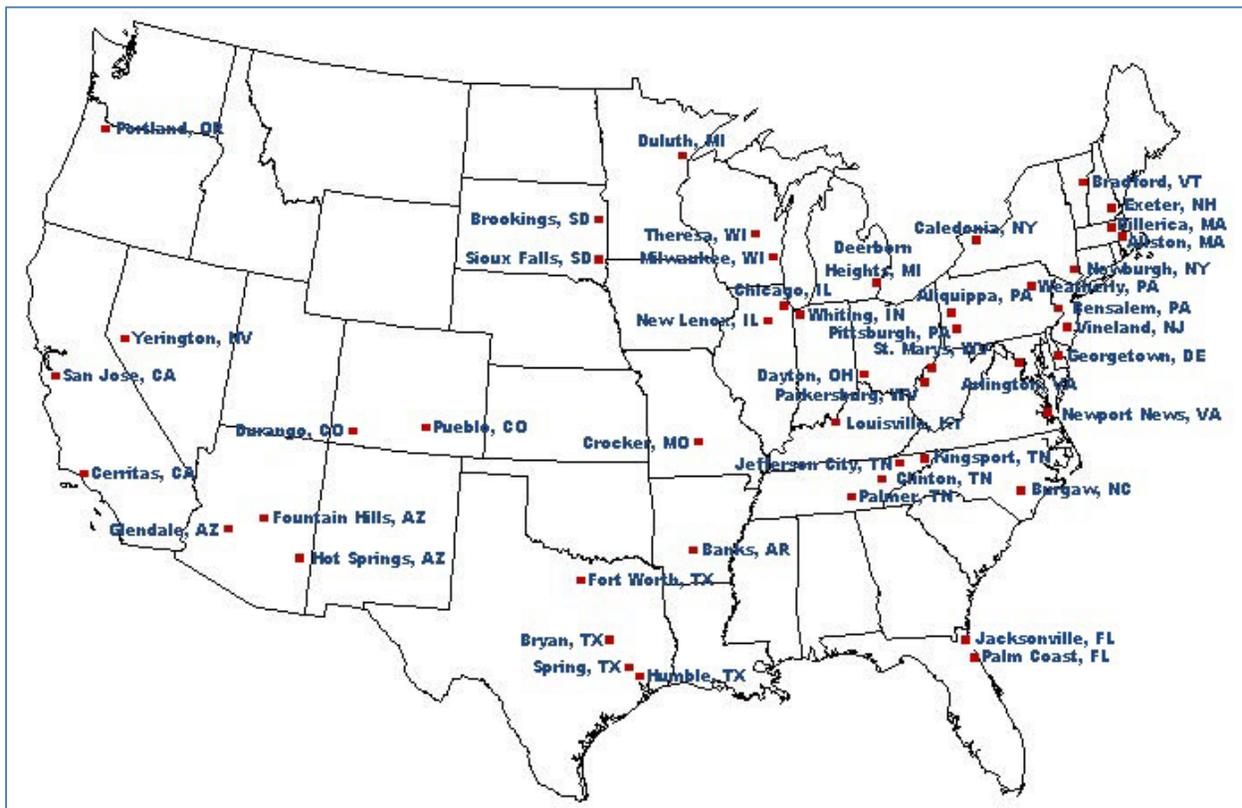


Figure 3. Locations of the 54 programs that participated in the study.

We matched the programs with respect to geographic location, aggregate income level of the program participants, and race/ethnicity distribution of the program participants. This resulted in two pools of programs. From these two pools, programs and their matches were randomly assigned to either the treatment group or the control group. Thirty-two (32) programs were assigned to the control group, while the other 32 programs were assigned to the treatment group.

In some cases, enrolled programs indicated that they did not have time to complete the study. We replaced these programs with another program that had similar characteristics. However, in

the end, there were ten programs that were unable to complete the study so our final sample size was 54 (27 treatment and 27 control group programs).

The full report provides details about the demographic and background characteristics of the sample programs and program leaders. There were no statistically significant differences between the treatment and control groups with respect to any demographic or background characteristics.

Activities

We asked programs to attempt to complete two hands-on science activities with the kids in their program during the period between the pre-test and post-test surveys. The activities included:

Float My Boat – An activity designed to teach kids about buoyancy.

Target Practice – An activity designed to teach kids about potential and kinetic energy, fulcrums and levers.

The number of kids who participated in the activities ranged widely across programs. The number of kids who participated in the activities is summarized below. In one case (a control group site) the program included multiple groups of kids in the hands-on activities (over 100 kids for each activity). However, this program was the exception. Most programs included between 11 and 14 kids in the hands-on science activities.

FETCH! training

The majority of the treatment group leaders took the training within two days of completing the online self-evaluation (93%). The majority of leaders spent 30 minutes to an hour reviewing the training (55.6%), while an equal number spent less than half an hour (22.2%) and over an hour (22.2%). Many leaders reported that they came back to revisit the FETCH! training several times throughout the study (37.0%). Leaders told us:

I did replay the video segment more than once, and took notes.

I looked at it afterwards to compare my experience.

I went back to look at the videos to see what (Susan) was doing. I've been back since, for more resources.

With respect to the slide shows, most leaders reported that they viewed the complete set of slide shows once (66.7%) or more than once (25.9%). The majority of leaders (59.3%) waited only a couple of days after completing the training before they began the activities with the kids. Seven leaders (26%) waited about a week to begin the activities, and four leaders (15%) had to wait two weeks because their afterschool programs only met a couple times per month, there was a vacation period, there was a shortage of staff, or it took some time to gather the materials they needed.

The balance of this document describes our study findings.

Findings

Treatment group leaders were more likely to report that their kids learned something new about science, got excited about exploring, and tested their new designs than control group leaders.

We asked leaders to indicate the degree to which their kids were impacted positively by the activities on a scale of 1 to 4 (1 = None of the kids, 4 = All of the kids). Leaders in the treatment group were more statistically more likely than leaders in the control group to report that most of the kids in their groups “learned something new about science,” “got excited about exploring, like scientists,” and “tested their new designs.” Leaders told us:

The kids were excited, jumping up and down, shouting out answers. They really loved it.

It was a good experience. I didn't expect it to go this good. A lot of kids you have to pull in to do programming, they just walk right out. The ones

Leaders in the treatment group were more statistically more likely than leaders in the control group to report that most of the kids in their groups “learned something new about science ($p = .02$),” “got excited about exploring, like scientists ($p = .02$),” and “tested their new designs ($p = .01$).”

who participated had a great time and I had to calm them down. They went in hallway and had competitions. It was a blast. I didn't expect it to be that fun. Unexpected fun.

The kids were really excited; wanted to learn more. Our community is lower socio economic, so kids seeking additional resources on these subjects was great to see.

The kids really liked it. They were excited about it; asking lots of questions, coming up with their own games. They were excited to go home and show their families.

The training helped leaders approach, lead and prepare for activities more effectively than before.

Almost uniformly, participants commented that the training was helpful because it helped them approach, lead, and prepare more effectively than they typically do. Several specifically mentioned that the guidance on how to prepare open-ended questions helped get their kids involved. During the follow-up interviews, leaders reported that the training helped them...

- Become better prepared and / or more relaxed in leading and approaching experiments (n = 14)
- Prepare questions, discussion points and get kids involved (n = 4)
- Let kids test and revise (n = 3)
- Let kids take more control and ask questions (n = 3)

"I learned that I wasn't as prepared to lead an activity as I thought (before the study)."

Leaders told us:

I was more aware of what I needed to explain to them and what I needed to prepare and the materials I needed. After I did the training, I was able to think about what I could substitute to make it work. Training helped me know what I needed to do and other ways to approach it. The kids were able to be 100% hands-on. Other activities before were more like mini-lectures. They couldn't touch anything. But, with this one, the kids were able to do everything themselves. They were able to think for themselves and figure out what they needed to do. They were more hands-on and involved. They were telling me where we should go with it. They were more involved.

I felt like the training gave me more ideas. Before the training, I wouldn't have let them revise. It definitely helped me prepare more.

It provided a different way to approach what I'm doing with them, and hopefully improved the way that an activity is done with younger kids. Now they're getting to the age where they can start thinking for themselves. It helped me to get them to start thinking for themselves.

It was different for my kids because I did a better job. I did a better job because of my participation.

I learned that I wasn't as prepared to lead an activity as I thought (before the study).

The training helped leaders feel more comfortable leading hands-on science activities.

We developed a scale to assess leader's comfort level leading hands-on science activities with kids. When we compared pre-test and post-test scale scores, we found a statistically significant improvement in scale scores for the treatment group after completing the training. The control group did not demonstrate a significant improvement in scale scores over time. Thus, it appears that the training helped leaders feel more comfortable leading hands-on science activities ($p = 0.049$). During the follow-up interviews, leaders told us:

I did feel more comfortable.

I was more relaxed. I really had fun watching the children really thinking about it and interacting like scientists.

I was more confident (in preparing) because I saw her do the activity already, so I knew what to expect. I felt more prepared about sharing and revising and testing so it was more applicable to the kids.

The training helped leaders feel more comfortable leading hands-on science activities ($p = 0.049$)

Treatment group leaders felt more strongly that kids should learn about science outside of school *after* they used the training than before they used the training.

Moreover, treatment group leaders exhibited a statistically significant increase over time in the belief that it was important to teach kids about science outside of school. Control group leaders did not report an increase or a decrease over time in their beliefs of the importance of teaching kids about science outside of school ($F(df = 2) = 24.687, p = 0.000$).

Treatment group leaders were more likely than control group leaders to try the activities first, prepare a list of variables, and perform extra research before leading the activities with kids.

We asked leaders to tell us how they prepared to lead the hands-on science activities. Leaders who participated in the FETCH! training were more likely to report that they tried the activities themselves than leaders who did not ($p < .05$). Leaders who participated in the training were also more likely to report that they wrote down a list of variables in order to help the kids experiment than leaders who did not ($p < .01$). Also, leaders who participated in the training were more likely to do a little extra research so they could understand the science behind the activities than leaders who did not participate in the training ($p < .05$).

Leaders reported the biggest take-aways from the training were: use open-ended questions, let kids direct the activity, get prepared ahead of time, experiment with different variables, and use hands-on activities to teach kids about science.

We asked leaders to tell us the one or two “big ideas” that they would take away from the training. The most common responses were:

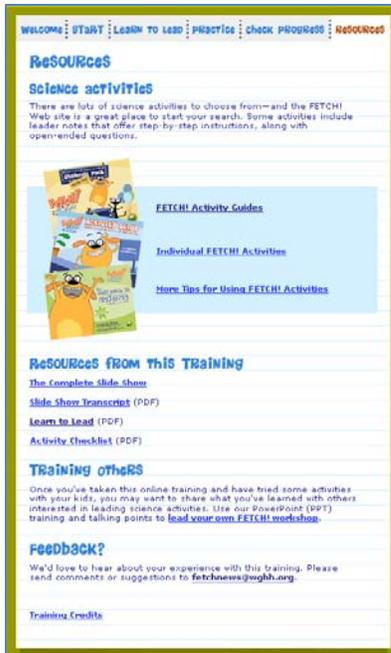
- Use open-ended questions to help involve kids more in the activity without telling them what to do (n = 7).
- Get prepared ahead of time and try the activities yourself first (n = 4).
- Experiment with different materials and lots of different variables (n = 3).
- Kids will respond to science so much better with hands-on activities (n = 3).

Other ideas that leaders shared with us included:

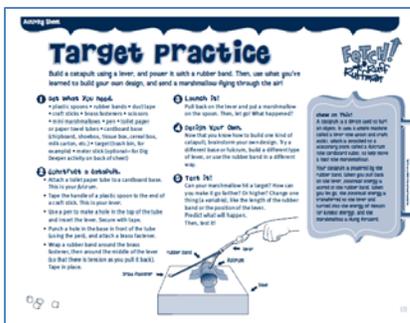
- Science activities can be interesting to kids who you think would not be interested in science activities.
- As an adult leader, you don't have to be a scientist to talk science with kids. It's ok to say "I don't know."
- Don't give materials out right away; let the kids think about it.
- Let kids take control of it. They learn a lot more than way.
- Girls should know that they are scientists.
- Let the kids compare their work with others.
- Revise and test with the kids.
- Document everything in a journal.
- Keep the kids who finish first busy without disrupting everyone else who is still working.
- Kids love physics as much as they love chemistry.

Treatment group leaders reported that most of the training components were very useful in helping them lead hands-on science activities.

We asked leaders to rate the usefulness of the various training components. On average, leaders reported that most of the components were very useful. The top 5 most useful components, according to leaders, were the:



Additional Resources – A section of the site that included additional activity guides and activities, tips for using the FETCH! activities, training resources, and resources to help train others.



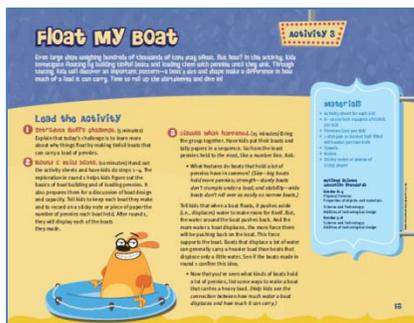
Target Practice Activity Sheet (pdf) – The activity sheet that leaders followed in order to lead the Target Practice activity with kids.



Learn to Lead Training – The whole training, including all of the individual modules.



Float My Boat Activity Sheet and Leader Notes (pdfs) – The activity sheet that leaders followed in order to lead the Float My Boat activity with kids.



In addition to the high ratings that leaders gave almost every aspect of the training, we also noted the frequency with which leaders used the optional training components. For example, even though these components were not required parts of the FETCH! training...

“It was nice to know how to get more in-depth to lead the activities.”

“It took our program to a whole new educational level...we actually learned something.”

- More than half of the leaders used the Additional Resources page (56%),
- Almost all the leaders downloaded and used the Activity Checklist (96%),
- Almost all the leaders downloaded and used the Learn to Lead document (93%),
- Almost three-quarters of the leaders downloaded and used the Journal (74%),
- More than half downloaded the transcript of the slide show (56%), and
- And almost a quarter of the leaders downloaded the Powerpoint presentation to help them train others to lead hands-on science activities (22%).

About the training, leaders told us:

Having the different steps broken down made it more successful.

It was a way to prepare and to think about your program. I really wanted the kids to get the science behind the things. I never thought I was strong in science so I didn't want the children to have that same experience. Helped me focus and come up with talking points.

It was nice to know how to get more in-depth to lead the activities.

It took our program to a whole new educational level...we actually learned something.

The self-evaluation (including score reports) received the lowest usefulness ratings. Despite this, 66.7% of the leaders reported that they would not add anything to the self-evaluation. Some leaders (those who had fewer years of experience with science activities) reported that the self-evaluation was helpful to them because it showed them how much they learned from the training. Despite the fact that the average leader found the self-evaluation to have little utility, some leaders told us that despite showing a lack of improvement from pre-test to post-test, they still felt that they learned something from the training:

We lead activities like this every day. We use science twice a week in our program. Even though I do a lot of science, I still felt like I learned something about being prepared, keeping a journal, and asking open-ended questions with the kids.

People doing this have experience. I am an engineer. I felt very comfortable with it before I started, but that's not to say I didn't learn anything. I did.

My comfort didn't change, but I did learn something from the training.

Many of the leaders (66.7%) reported that they would share their self-evaluation results with a supervisor, if they believed that the supervisor considered it a valuable form of professional development. Forty-four percent reported that they would invite their supervisor to observe them leading an activity with kids so as to develop their skills even further, and 29.6% reported that they would use the results of the self-evaluation to make a case for a raise or promotion.

Treatment group leaders were pleased at the visual nature of the training.

We asked leaders to tell us what they expected from the training. They reported that they expected:

- Ideas for science activities (37.0%)
- Ideas for getting kids interested in science (37.0%)
- Tips for becoming better at leading science activities (33.3%)
- Ideas for hands-on activities (29.6%)
- Ideas for leading activities found in the FETCH! activity guide (25.9%)
- A list of general science activities (11.1%)

"We lead activities like this every day. We use science twice a week in our program. Even though I do a lot of science, I still felt like I learned something about being prepared, keeping a journal, and asking open-ended questions with the kids."

One leader reported that she expected "to be lectured at" like other trainings she has participated in "because most trainings just write everything down (using text)." She was "pleasantly surprised" that this was not the case with FETCH!

- Ways to get low income kids interested in any program (3.7%)
- How to ask different types of questions (3.7%)
- Someone modeling teacher behavior (3.7%)

One leader reported that she expected “to be lectured at” like other trainings she has participated in “because most trainings just write everything down (using text).” She was “pleasantly surprised” that this was not the case with FETCH!.

Leaders reported that the training contained “just the right amount” of information and that it enhanced students’ experience of the hands-on science activities.

Most leaders (93%) reported that the training contained “just the right amount” of information. One leader reported that the training contained too much information, while another indicated that the training did not contain enough information. Leaders told us:

I didn't feel bombarded. There was stuff I could take away and stuff I was familiar with that I could skim over.

It was not overwhelming.

Leaders would recommend the FETCH! training to others who work with kids and plan to use it again.

All of the leaders (100%) reported that they would recommend the FETCH! training to someone else. Leaders recommended the training for:

- Anyone that works with kids (n = 6)
- Librarians (n = 4)
- Anyone with a little amount of experience (n = 4)
- Teachers / Assistant teachers (n = 4)
- Staff members / coworkers (n = 4)
- Anyone with a lot of experience (n = 3)
- Other scout leaders (n = 3)
- Parents or other community members (n = 3)
- After school programs (n = 2)
- Science teachers (n = 2)

All of the leaders (100%) indicated that they planned to use the FETCH! training again in the future, either for themselves or to train others.

Summary

This evaluation study found that the FETCH! training successfully achieved its goals of:

- Preparing leaders for leading hands-on science activities;
- Enhancing leaders’ comfort in leading hands-on science activities;

- Helping leaders teach kids about specific science content knowledge and skills (e.g., making predictions, understanding real-world connections); and
- Helping leaders get kids excited and engaged in hands-on science activities.

The FETCH! training brings an added value to the already-proven FETCH! hands-on activities. The FETCH! training appeared to provide just the right amount of information to adults working with kids across a variety of informal educational settings, across the country. The FETCH! training helped leaders to be more prepared and more comfortable leading hands-on science activities with kids. The FETCH! training also appeared to enhance leaders' ability to convey science concepts and processes and leaders' ability to engage kids and get them excited about doing science activities. While the FETCH! activities alone also appear to be highly effective at engaging kids, the FETCH! training used in combination with the activities were successful at helping leaders approach the activities with more confidence and a higher degree of preparation than leaders who used the FETCH! activities without training.