



Evaluating "Current Science" Shows

by Stephanie Long, Science Live Theatre, Science Museum of Minnesota



Dan Hopman performing *Dating Dinosaurs* with a volunteer playing pin-the-tail on the T. Rex.

The Science Museum of Minnesota

Thanks to the generous support of IMLS, Science Live Theatre created three comedies about current science. Below you will find our evaluation results and information about our scripts, which are available free-of-charge for you to produce and to make your own.

In our first show, *Dating Dinosaurs*, you need to plan a birthday party for a T Rex. You must determine the dinosaur's age in order to put enough candles on the cake.

Our second show, *As the Worm Turns*, satirizes hospital soap operas and introduces the field of biomimicry, the science of imitating nature.

Storming the Castle, our third show, is set in a castle's laboratory where a doctor is building with biology. The other character, the villager, attempts to get the audience to storm the castle and put an end to synthetic biology.

As promised, here's our evaluation approach and some of our findings. Formative evaluation examined if each show was entertaining and if the science content was consumable. Actors collected surveys and the evaluators cleaned the data. All three shows received positive comments from visitors, but we also wanted to explore the following questions in our summative evaluation:

continued on page 4

Central Park Zoo Quests:

Public Engagement Success at the Central Park Zoo

by Bricken Sparacino, Manager of Live Interpretation, Wildlife Conservation Society

Now more than ever, it is important for cultural institutions to connect their audience to their mission. As an example, the Wildlife Conservation Society (WCS) created the 96 Elephants campaign, which included protection of elephant habitats, coordination with local and international governments to end ivory poaching, and interactive zoo exhibits, to share this important work with the WCS zoo visitors. Without the visitor component of the 96 Elephants campaign, visitors would leave the zoo without learning that the WCS is a major part of the efforts to save the African elephant. Additionally, the WCS would lose an opportunity to recruit visitors' support.



B. Sparacino

Ranger Rae (Nikki Casseri) with zoo guests

The good news is that more and more guests of cultural institutions want to learn. A 2014 study found that 70% of zoo guests include learning as one of the reasons they come to zoos (Roe & McConney 2014). There has been an important cultural shift in guests' expectations; they are now coming to the zoo to learn. It is also worth noting that the Roe & McConney study found guests left zoos feeling like they should do something to help conservation efforts, but that they had not been given any actionable information during their visit.

The scripted interaction seems to have allowed for a more directed educational outcome, creating a richer learning experience.

It behooves modern zoos to ensure that guests are given the opportunity to learn and make connections to conservation actions that zoos are engaged in around the world. This is a

useful lesson for all cultural institutions, and one way to keep zoos and museums relevant for the 21st Century.

The Wildlife Conservation Society has developed a "2020" strategy to help strengthen our conservation messages. With this strategy in mind, we at the Central Park Zoo's education department created the theatrical and interactive "Central Park Zoo Quests" program to provide guests the learning opportunities they seek.

The WCS Education Department, located at the Bronx Zoo, Queens Zoo, Prospect Park Zoo, Central Park Zoo, and the New York Aquarium, has chosen the 2020 strategy of "inspire" as its new programming motivation. The "inspire" goal hopes to engage and educate, connecting people to wildlife, and inspiring those people to conservation action. We at the Central Park Zoo (CPZ) piloted the "Central Park Zoo Quests" (Quests) program in summer 2015 to meet this new 2020 goal. The CPZ Quests program was designed to use theatre, inquiry, and citizen science techniques to highlight important scientific information in a fun and engaging way. Each task promotes scientific knowledge and includes an opportunity to speak about conservation actions that can be done after the participant leaves the zoo.

We chose theatre as a teaching strategy for many reasons. Theatre can connect the audience to the lessons of the play through the emotions it evokes. Also, many people learn more easily if they are able to physically participate. Museum and zoo theatre often includes audience participation like songs, act-outs, and games to engage learners.

The Quests program includes theatre with elements of participation and aims to connect to the guests' emotions, creating a deeper learning experience.



Professor Flight (Wendy Walter)

Judith Wolfe

Other programs have found that one-on-one interactions between actors/educators and guests help to significantly raise the perceived learning in an exhibit. The Milwaukee County Zoo has a program where actors play characters and interact with guests. They found that 65% of adults who interacted with actors while in the exhibit recalled science information, compared to just 35% who had no actor involvement (Mills, McLellan & Williams 2013).

The Quests program has 5 stations. This article will focus on the two stations with actor/educators. Professional actors, who were specially trained to lead these inquiry-theatre blended interactions, portrayed Professor Flight and Ranger Rae. Guests who participated in Quests received a colorful map that guided them around the facility.

The first stop on the map is the Tropic Zone. As guests enter the Tropic Zone exhibit, they meet Professor Flight. The Professor engages with the guests and explains that she needs their help to solve a scientific mystery. Guests who are interested are given a mystery card to guide them. The guests explore the tropic exhibit while solving the mystery. Mysteries highlight the bird collection, adaptations, and endangered and endemic species.

At the end of the exhibit, Professor Flight's assistant, "Chris" waits for guests. Chris takes the visitors' mystery answer guesses and talks to them about things they can do to help birds in the wild. This learning conversation encourages guests to offer conservation actions that can be done at home to help animals all over the world. Chris also recorded the conversation on the "What can you do next?" log, which allowed us to track what people were learning and gave the guests a sense that their observations were important. Guests then got a stamp on their Quests map and continued their quest at the next station.

The good news is that more and more guests of cultural institutions want to learn.

At the Bear station, visitors meet Ranger Rae, a "ranger in training," who one day hopes to work at Yellowstone. Guests are invited to explore bio-facts about bears and then, with Rae, find the grizzly bears on exhibit. Ranger Rae leads guests through a simple guided inquiry, asking them questions about what they see and think and then has them make some scientific "hypotheses." Rae takes notes of their theories to be "submitted" later with her research. Guests learn about bear behaviors, their omnivorous nature, and special adaptations.



Ranger Rae (Nikki Casseri) and zoo guests

The other stations were led by teen volunteers. They interacted with guests at a citizen science birding station, a "measure up to penguins" station, and a final station whose goal was to raise awareness about the 96 Elephants campaign. The program was offered to visitors five days a week from July 1st through Labor Day weekend and then Saturdays and Sundays in the fall.

When a cultural institution is creating new programming, it is important to demonstrate its success quantitatively. Empirical visitor data can help explain a program's success to board members and possible donors or sponsors. We had a sense that the Quests program was a success. We could see guests at each station actively participating, using binoculars, reporting their findings to Professor Flight, and trying to care for their "eggs" like a king penguin.

However, we wanted to ensure that the visitor data matched our informal observations. A survey was developed with the help of the WCS's Education Research and Evaluation Department. The survey measured guests' satisfaction both quantitatively and qualitatively. Guests were asked to self-report their learning and enjoyment on a Likert style, 1 to 5 scale. The Likert style items included:

- ◆ I enjoyed my Central Park Zoo Quests experience, and
- ◆ Participating in the Central Park Zoo Quests added value to today's visit.

Guests were also asked to write about what they had learned and enjoyed with these qualitative questions:

- ◆ What was your favorite part of the Zoo Quests?
- ◆ Tell us one thing that you or your child learned from completing the Zoo Quests.

During August 2015, seventy-six surveys were completed at Central Park Zoo. Survey data were analyzed for meaningful trends. The data suggested that the Quests program was very successful. Of those surveyed, 98% either agreed or strongly agreed (4s and 5s) with all the statements. When asked to write about their “favorite” part, 50% mentioned things that they had learned during the program. When asked to write about what they had learned, 57% mentioned specific things they learned during the interaction with the actor/educators.

Looking more closely at the qualitative data, the interactions with Professor Flight and Ranger Rae show special strengths. When asked to write about what they learned, some of the participants included these scientific vocabulary words: environment, hibernations, extinct, endemic, endangered, omnivore, primate, and conservation. These words are part of the scripted encounters the actor/educators use when interpreting as Professor Flight and Ranger Rae. The scripted interaction seems to have allowed for a more directed educational outcome, creating a richer learning experience.

Data suggest the guests were more likely to walk away with the science knowledge the program intended to teach when their experience included the actor/educator interaction.

We also evaluated the Professor Flight’s “What can you do next?” logs. In one day alone, out of eighty people who participated in the Professor Flight station, twenty people said they would recycle, ten said they would turn out the lights, eight said they would carpool or walk more, seven said they would conserve water, two said they would put up bird feeders in their backyard, and one said they would plant a tree. This daily evaluation also showed the education message was being received.

With the results from the survey and information collected daily, data suggest the guests were more likely to walk away with the science knowledge the program intended to teach when their experience included the actor/educator interaction.

Of the survey respondents, 23% percent were from Manhattan, 35% were from the other four New York City boroughs, and 42% percent were from areas outside the city. Of the 42%, eleven different states were represented, ranging from New Jersey to California, plus three international locations (Argentina, Canada, and Sweden). Over the course of the season, the program reached an average of

405 participants a day. This broad reach combined with the overall high scores shows that the Quests program was an effective theatrical public engagement effort.

Most powerful perhaps is the reach of a cultural institution. We all see a blend of visitors from our local community to tourists who have traveled a great distance. This means a well-crafted, engaging education message extends beyond our own facilities as far as our visitors are inspired to take it. We are happy to announce the program has been funded for a second summer and is being expanded. For summer 2016, the Prospect Park Zoo will be developing a Quests program, and the Queens Zoo will be creating a pilot Quests program.

Bricken Sparacino works as the Manager of Live Interpretation at the Wildlife Conservation Society. She worked at the Central Park Zoo for over ten years as part of the Wildlife Theatre troupe. She created the theatrical elements of the Central Park Zoo Quests. In her new position, she will oversee the Quests as they develop at all five WCS facilities. She completed this article as a part of her graduate work with Project *Dragonfly* at Miami University in Oxford, Ohio.

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