

Assessment 1 - Using Secondary Data

Liberty Science Center Exhibit

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Two weeks ago, my brother came over with a cooler full of dry ice. He kept my three kids busy for a few hours while he did all different kinds of experiments with them. They were so intrigued and engaged. I heard them ask questions such as; What is dry ice? Why is there a reaction when the dry ice is added to water? Why does the cloud fall towards the ground? It was great. I have never seen them so interested in science before.

When I found out that we had to create an exhibit, naturally, this was the first thing that came to my mind. If my children asked these types of questions, I am sure that others would ask similar questions when they walk up to a dry ice exhibit.

Ideally, I would love to create an exciting, interactive, hands-on exhibit. Especially since, “in general, interactive exhibits have been found to be highly attractive for visitors” (Schwan, Grajal, and Lewalter, 2014). I think a great way to execute something like this would be through a show. A show would definitely be interactive, fun, and engaging. It would also allow the science center to demonstrate several different kinds of exciting experiments, as well as be able to include volunteers so that visitors have an intense, hands-on experience. As great as this sounds, realistically, I think it would be too costly to continually run a show like this. Therefore, for the purpose of keeping the project cost effective, I chose to create an exhibit instead.

As I contemplated how I would like to create the exhibit, my first idea was to have a big block of dry ice and use some kind of faucet with a timer to drip water on it. However, as I thought more about it, I realized that eventually the ice would build up on top of the block of dry ice and the experiment would no longer work. This led to come up with the idea of using small

dry ice pieces and having them drop into a shallow aquarium type container that is filled with warm water (see figure 1). There would be a button on the display or on the wall and whenever a visitor presses the button, a dry ice cube would be released into the water. The button would also have a timer feature that would not release more than one cube every five minutes. I realize that five minutes may not be cost effective. If so, the timer would be adjusted for a longer length of time. The small, shallow aquarium would be clear so that observers will be able to observe what is going on not only outside of the water, but inside as well. The filter on the aquarium would run continuously to with warm water so that it does not freeze from the dry ice that is repeatedly dropped in from above.

*Figure 1.*

*A visual representation of what the dry ice exhibit may look like.*



In order for the exhibit to be safe, the display would have to be in a ventilated area and out of the reach of the visitors. Ideally, there would be a barrier to keep visitors from standing too close. However, it would be thoughtfully displayed in a way that the smoke from the carbon dioxide water vapor would reach the observers. I feel that this is necessary to make sure that visitors are able to feel the smoke, swat their hands through it, and get excited about it. This is an important component that would ensure that the exhibit is interactive and engaging.

While thinking about the design and execution of this exhibit, I thought of several ways that it could be improved to make it more exciting. For instance, one thing that would be amazing would be to create the display on a larger size scale by simply using a bigger aquarium tank. If the science center has enough room to do this, it would allow the smoke effect to be more intense, thus allowing visitors to have a more memorable experience.

Feinstein and Meshoulam (2014) stated that “we use the word “exhibit” to refer to a single display or interactive object that visitors encounter on the floor and the word “exhibition” to refer to a thematic collection of exhibits.” This made me think about how if it is feasible to maintain, in regards to cost, I would love to turn this exhibit into an exhibition by adding several tanks, each with a different color water or have several interactive stations where different experiments are going on. At the very least, although maybe not as fun, there can be a few screens that repeat pre-recorded experiments to show visitors all of the exciting experiments that they could do at home.

Another thing that would I like to incorporate into the dry ice exhibit is QR codes or some kind of augmented reality. I feel that this could be beneficial because when I visited the Liberty Science Center I noticed that when someone was trying to read the information about the

exhibit, it made it hard for someone else to read it, especially the ones that needed the blacklight. A simple QR code under each plaque would be helpful. Individuals could have the option to scan the code and then have the information about the exhibit right in front of them on their device. The QR code also gives endless options, such as adding videos, photos, or links for more information. Visitors would be able to bookmark things that are of interest to them and go back to it later.

Dry ice is relevant in the world of science and this exhibit would show visitors how science can be cool and fun. The average person has probably heard of dry ice and knows some of the ways that it can be used, but they probably do not know much more about it. Thinking about how Bozdoğan and Yalçın reported that there was “an increase in interest in science and an improvement in academic achievement after a visit to a science exhibition center in Turkey” (as cited in Sasson, 2014), hopefully, this exhibit can do just that and spark an interest for someone to learn more about science. Additionally, Sasson (2014) mentioned that, “These environments can have an impact on learning while addressing aspects of science education that might be missing in more formal, class-based science learning environments”. Who knows, after experiencing the dry ice exhibit, visitors may find themselves interested in chemistry or physics, which could lead to wide variety of careers.

“Informal learning environments, such as visits to science centers provide valuable motivational opportunities for students to learn science” (Sasson, 2014). In fact, “Liberty Science Center’s mission is to get learners of all ages excited about the power, promise, and pure fun of science and technology” (Liberty Science Center, 2017). I know that while my children were doing the experiments with my brother, they were engaged, having fun, and had a ton of

questions about dry ice and how it works. In fact, for days following, they were looking up experiment videos on YouTube.

This makes me think about how visits to places like the Liberty Science Center “may trigger other science-related leisure activities, from watching TV documentaries and reading books to collecting specimens and experimentation (Schwan, Grajal, and Lewalter, 2014). If doing some simple experiments at home, peaked my children’s interest, I can only imagine that seeing something like this in a science museum would would have the same effect.

Schwan et al. (2014) talked about “the different types of visitors as being: explorer, professional/hobbyist, facilitator, experience seeker, and recharger.” An exhibit like this, seems like it would reach all types of different visitors, as well as fulfill the mission of the Liberty Science Center.

I hope that visitors will stay at the dry ice exhibit for an extended period of time. This would be one indication that the display is successful. And when they walk away from the exhibit, it would be my goal to make sure they know answers to the basic questions that my kids were asking. For instance, they should know that dry ice is made up of frozen carbon dioxide and the cloud-like mixture of carbon dioxide and water floated to the ground because it is heavier than the surrounding air, as well any other answers to the questions that mesmerized them to walk up to it in the first place. If they learned at least fact about dry ice that they did not know before they walked up to the exhibit, that is success.

## References

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