



**Science  
Museum**  
of Minnesota®

*Department of Evaluation  
&  
Research in Learning*

**Current Science  
Summary Report on  
Formative Evaluation  
2005-2006**

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## OVERVIEW

Formative evaluation of Science Buzz in the Science Museum of Minnesota (SMM) began November 2005 and was completed June 2006. Six studies were conducted to assess various Science Buzz components. Each study provided a deeper understanding of the use of the Science Buzz exhibits and website which was used to refine existing components and guide further development of the project. Below are brief descriptions of the studies included in this report.

### *Science Buzz Branding Study*

The branding study measured visitor recognition of the Science Buzz logo throughout the museum as well as visitors' abilities to recall the Science Buzz exhibits they saw, how they characterized the exhibits, and their expectations.

### *Science Buzz Exhibitions Timing and Tracking Study*

The timing and tracking study assessed visitors' use of the Science Buzz exhibits. Observations noted amount of time spent at interactives, behaviors displayed, and specific usage details. The results provided a comparison of the different types of Science Buzz exhibits.

### *Scientist on the Spot Exhibit Interviews*

The Scientist on the Spot exhibit features a local scientist and his or her work. The exhibit invites visitors to post a question for the scientist as well as read previously posted questions and the scientist's response. Cued interviews were carried out with visitors to understand how they use Scientist on the Spot and their expectations for the exhibit.

### *Buzzette Timing and Tracking Study*

Visitor usage of two Buzzettes was examined through a timing and tracking study. Buzzettes are three-sided exhibits integrated into one of the museum galleries and provide visitors with information about a current news topic related to the focus of the gallery. Data were gathered to compare the use of Buzzettes to other exhibits within the same gallery and track the use of the three components of each of the Buzzettes.

### *Madagascar Topic Testing*

This study assessed the potential for the Science Buzz exhibit format to serve as a topic testing for future exhibitions. Visitors were interviewed about their impressions of the test topic, with an emphasis on prior knowledge, expectations, and interest in the content.

### *Science Buzz Website Usage Study*

Cued testing was conducted with the Science Buzz website in which usage of the site was tracked and visitors were asked to "talk aloud" during key points.

## **SCIENCE BUZZ BRANDING STUDY**

A branding study was carried out to examine visitor awareness and perceptions of Science Buzz. Visitors age eight and above who had spent at least an hour in the museum were interviewed. A random sampling method was used in which the third eligible visitor to walk over an imaginary line was approached for an interview. A total of 50 visitors were interviewed. Demographics for the branding study can be found in Appendix A.

### **Results and Discussion**

More than half (62%) of the visitors who had spent at least an hour at SMM remembered seeing the Science Buzz logo. About half of these visitors (57%) said they first noticed the Science Buzz logo in the Mississippi River Gallery. This gallery is located near the entrance to the exhibit halls so it is the first potential encounter visitors can have with Science Buzz.

Visitors recognized that Science Buzz was a collection of exhibits. Around a quarter (26%) of the visitors who saw the logo recalled seeing three or more Science Buzz exhibits. A third (33%) recalled seeing two Science Buzz exhibits. The other visitors (41%) recalled seeing one Science Buzz exhibit. Although Science Buzz exhibits are spread throughout the museum, visitors reported that they did not actively look for the exhibits as they went through the museum.

Visitors who recalled seeing the Science Buzz logo were asked to describe what they saw in the Science Buzz exhibits. Visitors' responses were coded in themes based on the various Science Buzz features in the museum (exhibitions, exhibits, signs). Visitors were able to recall a variety of these features (see Table 1). However, almost half (48%) of the visitors simply recalled seeing the Science Buzz logo and could not remember anything about the exhibits. Many of these visitors said they could not recall because they noticed the exhibitions or exhibits but did not stop to look at them.

Visitors' perception of Science Buzz reflected a view that was similar to the typical perception of the museum. Specifically, visitors were asked to rate how accurately a series of words or phrases described what they saw in the Science Buzz exhibits. On a scale of 1 to 10 where 1 was "completely inaccurate" and 10 was "completely accurate", visitors thought that 'reliable' and 'everyday life' were the most accurate descriptors of Science Buzz (see Table 2). The average ratings for all of the phrases fell between 6.9 and 8.8, so there were no phrases that were rated as inaccurate. The phrases visitors thought were the least accurate descriptors were 'science that is up to the minute', 'frequently updated information' and 'local issues.' Visitors demonstrated a critical lack of awareness of the speed at which Science Buzz is responsive to current events, but visitors were also clear that they did not need or want this in a museum exhibit. More than half ranked it as the lowest priority when asked to rank a series of features of Science Buzz. Visitors' highest priorities for Science Buzz were more hands-on experiences and more connection to everyday life – features typical of most SMM exhibits, but not critical to the goals of Science Buzz. Changing visitors' perception of Science Buzz and the timeliness of its content remains a critical challenge that is hampered by public perceptions of science museums in general.

Table 1: Visitor Recollection of Science Buzz Exhibits (n=29)

*\*Some visitors gave more than one response.*

| <b>What Visitors Saw</b>                 | <b>Percent of Visitors</b> | <b>Sample Responses</b>  |
|--|----------------------------|--|
| Couldn't Recall                          | 48%                        | <ul style="list-style-type: none"> <li>• Just saw it. Didn't go in.</li> <li>• Don't remember.</li> </ul>                  |
| Scientist on the Spot Exhibit            | 14%                        | <ul style="list-style-type: none"> <li>• Ask the professor.</li> <li>• Ask questions.</li> </ul>                           |
| Dinosaurs Science Buzz Exhibition        | 10%                        | <ul style="list-style-type: none"> <li>• Dinosaurs.</li> <li>• Madagascar, Teeth.</li> </ul>                               |
| Quiz Show Exhibit                        | 10%                        | <ul style="list-style-type: none"> <li>• Trivia.</li> <li>• Science questions of various types, like Quiz Show.</li> </ul> |
| Zebra Mussels Sign                       | 7%                         | <ul style="list-style-type: none"> <li>• St. Croix.</li> </ul>   |
| TV Newscast Exhibit                      | 7%                         | <ul style="list-style-type: none"> <li>• TV news desk.</li> </ul>  |
| Take Photos Activity (Part of Buzzettes) | 7%                         | <ul style="list-style-type: none"> <li>• Take picture of self and send it to someone.</li> </ul>                           |
| Avian Flu Buzzette                       | 7%                         | <ul style="list-style-type: none"> <li>• Avian flu.</li> </ul>   |
| Other                                    | 7%                         | <ul style="list-style-type: none"> <li>• Web browser.</li> </ul>   |

Table 2: Average Accuracy of Words or Phrases in Describing Science Buzz Exhibits

| <b>Words and Phrases</b>                      | <b>Average Accuracy</b> |
|---|-------------------------|
| Reliable (n=12)                               | 8.83                    |
| Science that connects to everyday life (n=12) | 8.67                    |
| See what scientists are doing (n=12)          | 8.42                    |
| Ask questions about science (n=11)            | 8.27                    |
| Familiar topics (n=12)                        | 8.25                    |
| Science behind the news (n=12)                | 8.00                    |
| Not your typical museum experience (n=12)     | 7.67                    |
| Local issues (n=12)                           | 7.67                    |
| Frequently updated information (n=11)         | 7.55                    |
| Science that is up to the minute (n=12)       | 6.92                    |

## SCIENCE BUZZ EXHIBITIONS TIMING AND TRACKING STUDY

Science Buzz exhibitions were located on Levels 3 and 5 of the museum. The Level 3 exhibition was about Dinosaurs of Madagascar and the Level 5 exhibition covered a variety of current science topics. A timing and tracking study was carried out to assess exhibit usage. Visitors age eight and above were eligible for the study. A random sampling method was used in which the third eligible visitor to walk over an imaginary line was observed. A total of 209 visitors were tracked on Level 3 and 221 on Level 5. Demographics for the visitors tracked on Levels 3 and 5 can be found in Appendix A.

### **Results and Discussion**

Visitors spent more time at the Level 3 exhibition (median time of 2 minutes, 22 seconds) than the Level 5 exhibition (median time of 1 minute, 24 seconds). However, visitors stopped at more exhibits in the Level 5 exhibition (median of 2 out of 8 possible stops), than the Level 3 exhibition (median of 1 out of 7 possible stops). The Quiz Show and TV Newscast were the most popular exhibits (see Table 3). They were also the first stop for more than half of the visitors to the Level 3 (54%) and Level 5 (64%) exhibitions. The popularity of the Quiz Show and the TV Newscast can be explained by the highly interactive and social nature of these exhibits in comparison to the other Science Buzz exhibits.

Table 3: Percent of Visitors Stopping at Science Buzz Exhibits

|                                   | <b>Exhibit</b>        | <b>Percent of Visitors</b> |
|-----------------------------------|-----------------------|----------------------------|
| <i>Level 3 Exhibition (n=209)</i> | Quiz Show             | 65%                        |
|                                   | Scientist on the Spot | 24%                        |
|                                   | Bones (Right)         | 17%                        |
|                                   | Orientation           | 13%                        |
|                                   | Computer              | 13%                        |
|                                   | Bones (Left)          | 12%                        |
|                                   | Slides                | 9%                         |
|                                   | Post-It               | 8%                         |
| <i>Level 5 Exhibition (n=221)</i> | TV Active             | 48%                        |
|                                   | TV Viewing            | 40%                        |
|                                   | Objects               | 24%                        |
|                                   | Web                   | 20%                        |
|                                   | Scientist on the Spot | 18%                        |
|                                   | Orientation           | 17%                        |
|                                   | Headline              | 15%                        |
|                                   | Introduction          | 8%                         |
|                                   | Couch                 | 5%                         |

For each of the exhibits in Table 3, detailed usage data about time spent at each exhibit (median, minimum, maximum) and frequency of behaviors (e.g., talk to other visitors, read out loud, point) are available in Appendix B.

One issue of interest to emerge from this study is the dominance of the Quiz Show and the TV Newscast in their respective exhibitions. Around half the visitors on Level 3 (49%) only interacted with Quiz Show and over a third of visitors on Level 5 (37%) only interacted with the TV Newscast. Further studies could be conducted to identify whether visitors who only go to one of those exhibits recognize that the exhibits are connected to the rest of the Science Buzz exhibition.

## **SCIENTIST ON THE SPOT EXHIBIT INTERVIEWS**

Scientist on the Spot features a local scientist and his or her work. Visitors are invited to post a question for the scientist as well as read other visitors' questions and the scientist's responses. Scientist on the Spot exhibits are located in both the Level 3 and Level 5 Science Buzz exhibitions. During this study, the Level 3 exhibit featured a paleontologist who studies dinosaurs in Madagascar and the Level 5 exhibit featured a physicist who studies the physics of superheroes.

Cued interviews were carried out with visitors age eight and above to understand how they use Scientist on the Spot and their expectations for the exhibit. A random sampling method was used in which the third eligible visitor to walk over an imaginary line was invited to spend as much or as little time as they wanted at the exhibit and then participate in an interview. A total of 60 visitors were interviewed. Demographics for these visitors can be found in Appendix A.

### **Results and Discussion**

Based on the timing and tracking study of Level 3 and Level 5 Science Buzz exhibitions (n=450) described above, an average of 21% of visitors in the Science Buzz exhibitions stopped at the Scientist on the Spot exhibits. Of the visitors who stopped at one of the Scientist on the Spot exhibits, an average of 12% posted a question.

In interviews (n=60), visitors were asked what they expected to be able to do at Scientist on the Spot. Visitor responses were coded into themes and representative responses are included for each (see Table 4). Overall, visitors' expectations matched the content and activities available at the exhibit.

Visitors were asked how important it was that the featured scientist was local. Visitors felt the local connection was important, rating it an average of 7.6 on a 10-point scale. One of the main features of Scientist on the Spot is the ability to ask this local scientist a question. Visitors were asked what kinds of questions they expected to be able to ask the scientist. Responses were coded into themes and representative themes are included for each (see Table 5). The most frequently mentioned types of questions were related to the exhibit's content (63%). Only 7% of visitors were unsure what type of question they expected to ask the scientist.

Table 4: What Visitors Expect To Do at Scientist on the Spot (n=60)

*\*Some visitors gave more than one response.*

| Theme                   | Percent of Visitors | Sample Responses  |
|-------------------------|---------------------|---|
| Read Text               | 30%                 | <ul style="list-style-type: none"> <li>• Read what it is about. I like to find out what's going on with an exhibit before I go to it. Look for more details.</li> <li>• Read what is on the wall and the table text.</li> </ul> |
| Learn About the Topic   | 27%                 | <ul style="list-style-type: none"> <li>• Learn about how superpowers are used.</li> <li>• Study about dinosaurs and why we study dinosaurs.</li> </ul>  |
| Use Computer            | 27%                 | <ul style="list-style-type: none"> <li>• Would go straight to computer.</li> <li>• If I had any questions I would go to the computer.</li> </ul>  |
| Ask a Question          | 25%                 | <ul style="list-style-type: none"> <li>• Ask questions.</li> <li>• You can post questions up.</li> </ul>  |
| Read a Question         | 12%                 | <ul style="list-style-type: none"> <li>• Read a couple of questions and answers from professors.</li> </ul>   |
| Learn About a Scientist | 8%                  | <ul style="list-style-type: none"> <li>• Learn about a scientist who studies superheroes.</li> <li>• Learn about what Kristi Curry does. How she uncovered dinosaurs and what her team was like.</li> </ul>                     |
| Just Look Around        | 8%                  | <ul style="list-style-type: none"> <li>• Cruise around looking for headings that interest me. Something that catches my eye is what I would do.</li> </ul>  |
| Other                   | 8%                  | <ul style="list-style-type: none"> <li>• Expected comic books and characters especially ones that are extremely popular. Expected to demonstration on how they relate to science.</li> </ul>                                    |

Visitors were asked how they would expect to ask a question at the exhibit. Almost two-thirds (62%) expected to use the computer to submit a question. Only 15% expected to use the paper, and 17% expected to be able to use both. Two visitors said they would actually prefer to ask the scientist a question in person. About a quarter of visitors accurately understood when they would get the answer to their questions, i.e., the next time they were at the museum (23%) or on the Science Buzz website (22%). (Visitors were able to choose more than one response.) A significant number of visitors had misperceptions about when they would get a response. More than half (60%) expected the answer to be sent to their email. A greater concern is that a third (33%) expected to see an answer immediately on the computer.

Visitors to Level 3's Scientist on the Spot tended to have a higher level of interaction with the exhibit than visitors to the Level 5 exhibit. Interviews showed that the consistent theme of the Level 3 exhibition contributed to this difference. Data revealed that, for both levels, the question and answer feature of the exhibit needs to become more appealing. On average, visitors rated 'following up to get an answer to their question' a 5.6 on a 10-point scale. 'Reading other people's comments' was rated similarly (6.2 on a 10-point scale). Yet when asked to prioritize what they expected to do at Science Buzz in general (as part of the Branding study) visitors put a high priority on getting the chance to ask questions and see what scientists are doing. This suggests that Scientist on the Spot generally matches visitors' expectations and interests. But the existing process of asking the question and waiting for an answer is less in sync with visitors' interests and expectations.

Table 5: Kinds of Questions Visitors Expect to Be Able to Ask a Scientist (n=60)

*\*Some visitors gave more than one response.*

| Theme   | Percent of Visitors | Sample Responses   |
|---|---------------------|--|
| Exhibit Content (Superheroes and Dinosaurs in Madagascar) | 63%                 | <ul style="list-style-type: none"> <li>• Questions about unearthing dinosaurs. Stuff they hope to find.</li> <li>• How do you know what color they (the fossils) were?</li> <li>• Anything about Madagascar.</li> <li>• What kinds of properties would Spiderman need to use his web?</li> <li>• What part of physics does each character uses in their superpower?</li> </ul> |
| General Science (not directly related to exhibit content) | 18%                 | <ul style="list-style-type: none"> <li>• Our school is doing a forces of motion program. I would ask about what physics covers.</li> <li>• Give an example about wingspan. Would ask a question about water displacement and some on animals of the world.</li> </ul>  |
| Career  | 8%                  | <ul style="list-style-type: none"> <li>• How did she get into that type of work originally? Life journey stories are what I'm into.</li> <li>• How did you become interested in being a scientist?</li> </ul>  |
| Scientific Process  | 7%                  | <ul style="list-style-type: none"> <li>• How do you figure out these theories?</li> <li>• How she studied it? What kind of tools she used for her research?</li> </ul>   |
| Other   | 10%                 | <ul style="list-style-type: none"> <li>• Depends on what the scientist is.</li> <li>• Anything.</li> </ul>   |
| Don't know  | 7%                  |  |

## **BUZZETTE TIMING AND TRACKING STUDY**

A timing and tracking study examined visitor usage of two Buzzettes. Buzzettes are three-sided exhibits integrated into existing museum exhibitions. Buzzettes provide visitors with information about a current news topic related to the focus of the gallery. The three components of the buzzette are a computer, an audio recording, and an object. The two Buzzettes used in this study were the Hurricane Katrina Buzzette in the Mississippi River Gallery and the Avian Flu Buzzette in the Human Body Gallery. Data were gathered to compare the use of Buzzettes to other exhibits within the same gallery. Visitors were also tracked to gather information about how the three components of each of the Buzzettes were used.

Visitors age eight and above were observed as they walked past the exhibit being studied. Every visitor that walked by was counted. When a visitor stopped at the exhibit, the data collector focused their observations on only that visitor and the total time the visitor spent at the exhibit was recorded. For the Buzzettes, visitor use of the three components of the exhibit was also noted.

The number of visitors observed is detailed in Table 6. Visitor demographics were not recorded for this study since the focus was on obtaining a quick tally of the number of visitors passing by and stopping at the exhibit.

Table 6: Number of Visitors Observed Walking Past Each Exhibit

| <b>Exhibit</b>                   | <b>Number of Visitors</b> |
|----------------------------------|---------------------------|
| <i>Mississippi River Gallery</i> |                           |
| Hurricane Katrina Buzzette       | 297                       |
| River Pilot Simulation           | 158                       |
| Water Table                      | 312                       |
| <i>Human Body Gallery</i>        |                           |
| Avian Flu Buzzette               | 575                       |
| Blood Pressure Cuff              | 487                       |
| Video                            | 853                       |

### **Results and Discussion**

More visitors stopped at the Mississippi River Gallery Buzzette than the Human Body Gallery Buzzette (see Table 7). However, the percent of visitors stopping at the Buzzettes are similar to usage of other exhibits within the same gallery. The difference in percentages between the two galleries can be attributed to their location, since the Mississippi River Gallery is the first gallery visitors encounter when they enter the exhibit area of the museum.

Visitors stopping at the Buzzettes spent similar amounts of time at them (Mississippi River Gallery Buzzette median time of 36 seconds, Human Body Gallery Buzzette median time of 41 seconds). Median times at the Buzzettes were similar to some of the other exhibits in the galleries (Water Table and Video). However, visitors spent less time at the Buzzettes than they did at

some of the more interactive exhibits (River Pilot Simulation where visitors ‘pilot’ a river boat and Blood Pressure Cuff where visitors can take their own blood pressure).

Table 7: Percent of Visitors Stopping at Exhibit and Time Spent There

| <b>Exhibit</b>                     | <b>Percent of Visitors Who Stopped</b> | <b>Median Time</b> | <b>Minimum Time</b> | <b>Maximum Time</b> |
|------------------------------------|--|--------------------|---------------------|---------------------|
| <i>Mississippi River Gallery</i>   |  |                    |                     |                     |
| Hurricane Katrina Buzzette (n=297) | 16%                                    | 36 sec.            | 5 sec.              | 10 min., 28 sec.    |
| River Pilot Simulation (n=158)     | 26%                                    | 2 min.             | 7 sec.              | 11 min., 30 sec.    |
| Water Table (n=312)                | 20%                                    | 41 sec.            | 7 sec.              | 6 min., 59 sec.     |
| <i>Human Body Gallery</i>          |  |                    |                     |                     |
| Avian Flu Buzzette (n=575)         | 10%                                    | 41 sec.            | 3 sec.              | 18 min., 56 sec.    |
| Blood Pressure Cuff (n=487)        | 8%                                     | 1 min., 58 sec.    | 7 sec.              | 7 min., 41 sec.     |
| Video (n=853)                      | 7%                                     | 23 sec.            | 4 sec.              | 6 min., 57 sec.     |

Visitor usage of the three Buzzette components varied (see Table 8). Visitors spent the highest median time at the computer, spending slightly more time at the Human Body Gallery Buzzette’s computer. Follow up work should focus on differences between attraction to a component and its usage. For example, the difference between the percent of visitors who stopped (71%) and median time spent (22 seconds) at the Buzzette object in the Mississippi River Gallery. The object at the Mississippi River Gallery Buzzette had higher attraction than the object at the Human Body Gallery Buzzette. However, the median times spent at the objects were similar.

Table 8: Visitor Use of Buzzettes

|          | <i>Mississippi River Galley Buzzette (n=48)</i> |                    | <i>Human Body Gallery Buzzette (n=56)</i> |                    |
|----------|---|--------------------|---|--------------------|
|          | <b>Percent Stopped</b>                          | <b>Median Time</b> | <b>Percent Stopped</b>                    | <b>Median Time</b> |
| Computer | 44%   | 51 sec             | 36%                                       | 1 min 36 sec       |
| Audio    | 23%   | 28 sec             | 50%                                       | 36 sec             |
| Object   | 71%   | 22 sec             | 21%                                       | 26 sec             |

## MADAGASCAR TOPIC TESTING

The Dinosaurs of Madagascar Science Buzz exhibition included an exhibit with images and information about ten Madagascar-related topics. This exhibit provided a platform to test ideas for a potential Madagascar exhibit. For this study, two additional topics were added to the exhibit for a total of twelve topics. A cued interview with a random sampling method was used in which the third visitor age eight or above to walk over an imaginary line was invited to view the exhibit and then participate in an interview. Visitors were interviewed about their impressions of Madagascar, their interest in the topics, and their ideas for a potential exhibit. A total of 50 visitors were interviewed. Demographics for these visitors can be found in Appendix A.

### Results and Discussion

After reviewing the twelve topics, visitors voiced their first impressions of Madagascar. Visitors' responses were coded into themes and representative responses are included for each. Most visitors' first impressions about Madagascar were that it is a unique (38%) and interesting (34%) place (see Table 9).

Table 9: First Impressions About Madagascar (n=50)

*\*Some visitors gave more than one response.*

| Impressions              | Percent of Visitors | Sample Responses   |
|--------------------------|---------------------|--|
| Unique Place             | 38%                 | <ul style="list-style-type: none"> <li>• Very unique there. Seems like there is nowhere else in the world like it.</li> <li>• Unique plant and animal life.</li> <li>• A lot animals and plants that don't exist elsewhere.</li> </ul> |
| Interesting Place        | 34%                 | <ul style="list-style-type: none"> <li>• Seems like a really interesting place.</li> <li>• Impressive place.</li> </ul>  |
| Biologically Diverse     | 14%                 | <ul style="list-style-type: none"> <li>• A lot of biodiversity.</li> <li>• Most diverse place to find plants and animals.</li> <li>• Very interesting to see the diversity of plants and animals.</li> </ul>                           |
| Natural Habitats at Risk | 12%                 | <ul style="list-style-type: none"> <li>• Even though it is isolated, it's been harmed by human activity.</li> <li>• It is in danger.</li> </ul>  |
| Island Off Africa        | 8%                  | <ul style="list-style-type: none"> <li>• It is an island off the coast of Africa.</li> <li>• Only island country in Africa, or at least the biggest.</li> </ul>  |
| "Madagascar" the Movie   | 6%                  | <ul style="list-style-type: none"> <li>• I've never heard of this place before, other than the kid's movie.</li> </ul>   |
| Mysterious Place         | 4%                  | <ul style="list-style-type: none"> <li>• It is a mysterious place because of the location.</li> <li>• Mysterious island.</li> </ul>  |
| Other                    | 6%                  | <ul style="list-style-type: none"> <li>• This place sounds too good to be true. How do I get there? Is it a good vacation spot?</li> </ul>   |
| Didn't Have a First      | 6%                  | <ul style="list-style-type: none"> <li>• Uninformed. No knowledge.</li> </ul>  |

|            |  |  |
|------------|--|--|
| Impression |  |  |
|------------|--|--|

To gauge visitor interest in a potential Madagascar exhibit, visitors were asked to rate their likelihood of coming to see such an exhibit. There was high interest, with an average rating of 7.94 on a 10-point scale. Visitors were then asked about their interest in potential topics to include in a Madagascar exhibit. Of the twelve topics included in the Science Buzz exhibit, visitors were asked to indicate which three topics they would not include in a Madagascar exhibit. Visitors were least interested (40%) in the culture of Madagascar (see Table 10). Visitors were most interested in the diversity of animals found in Madagascar and their uniqueness. The most common reason visitors gave for not including a topic was lack of interest. Other reasons included the topic was too general, it did not connect to any of the other twelve topics, it was similar to the other topics, or the topic was too sad (e.g., habitat destruction).

Table 10: Topics to NOT Include in the Madagascar Exhibit (n=60)

| Topic                                    | Percent of Visitors |
|--|---------------------|
| Culture of Madagascar                    | 40%                 |
| History of dinosaurs                     | 30%                 |
| Orchids                                  | 27%                 |
| Fourth largest island                    | 25%                 |
| Baobab tree                              | 25%                 |
| Chameleons                               | 22%                 |
| Over 90% of natural habitat is destroyed | 18%                 |
| Major biodiversity “hot spot”            | 12%                 |
| Bird species                             | 10%                 |
| Madagascar has 72 kinds of lemurs        | 8%                  |
| 80% of animals don’t exist elsewhere     | 5%                  |
| 90% of reptiles are found nowhere else   | 5%                  |

The Science Buzz Madagascar exhibit included a mix of information and images to describe the twelve topics. The exhibit included information that was new to visitors, with 88% stating that they saw something in the exhibit they had never seen before. Visitors were then asked to describe what was new to them. Visitors’ responses were coded into themes and representative responses are included for each. As shown in Table 11, the exhibit included a variety of new information for visitors. The most commonly mentioned topics were related to the diverse and unique plants and animals in Madagascar with Baobab trees most frequently mentioned (39%).

The exhibit included a variety of topics that could potentially spark conversations between adults and children. To identify topics that may help to facilitate these conversations, visitors were asked if the exhibit included topics they would want to talk to a child about and if so, which topics would they discuss. Most visitors (88%) felt the exhibit included information they would discuss with a child. Topics visitors would talk about were coded into themes and representative

responses are included for each. Animals of Madagascar was the most popular topic for adult-child conversations. The topics chosen by the fewest number of visitors were more complex topics, such as habitat destruction, culture, conservation, and biodiversity.

Table 11: Information and Images New to Visitors (n=44)

*\*Some visitors gave more than one response.*

| <b>Theme</b>                      | <b>Percent of Visitors</b> | <b>Sample Responses</b>  |
|-----------------------------------|----------------------------|--|
| Baobab Tree                       | 39%                        | <ul style="list-style-type: none"> <li>• The trees. They are very different.</li> <li>• The trees, I have never seen anything like that.</li> </ul>  |
| Uniqueness of Animals             | 20%                        | <ul style="list-style-type: none"> <li>• Didn't know that 90% of reptiles were nowhere else.</li> <li>• I did not know the 80% of animals and how they are found nowhere else in the world.</li> </ul> |
| Chameleons                        | 16%                        | <ul style="list-style-type: none"> <li>• The little dude (chameleon) on the thumb. Didn't know there were any that small.</li> <li>• Chameleons.</li> </ul>  |
| All or Most of the Information    | 16%                        | <ul style="list-style-type: none"> <li>• All of this. I don't know anything about Madagascar and I have never seen any information on it.</li> <li>• There's a lot there I didn't know.</li> </ul>     |
| Lemurs                            | 9%                         | <ul style="list-style-type: none"> <li>• The fact about lemurs. I never knew how many there were.</li> </ul>   |
| Biodiversity in Madagascar        | 7%                         | <ul style="list-style-type: none"> <li>• Knew it was unique but didn't really realize just how much diversity there was.</li> </ul>  |
| Orchids                           | 7%                         | <ul style="list-style-type: none"> <li>• I never knew about orchids.</li> </ul>  |
| Habitat Destruction in Madagascar | 5%                         | <ul style="list-style-type: none"> <li>• Didn't know that 90% of natural habitat is destroyed.</li> </ul>  |
| Culture of Madagascar             | 5%                         | <ul style="list-style-type: none"> <li>• Never seen anything about the people of Madagascar.</li> </ul>  |
| Geography of Madagascar           | 5%                         | <ul style="list-style-type: none"> <li>• I thought it was smaller than Texas.</li> <li>• How close it is to Africa.</li> </ul>   |
| Other                             | 7%                         | <ul style="list-style-type: none"> <li>• Natural habitat.</li> </ul>   |

**Table 12: Topics for Potential Adult-Child Conversations (n=46)**

| Theme                             | Percent of Visitors | Sample Responses   |
|-----------------------------------|---------------------|--|
| Animals of Madagascar             | 57%                 | <ul style="list-style-type: none"> <li>• The different types of animals.</li> <li>• Can see my children being excited about the reptiles.</li> <li>• Let them know what is happening in the world to the wildlife population.</li> <li>• Lemurs.</li> <li>• Chameleons.</li> </ul> |
| Uniqueness of Madagascar          | 15%                 | <ul style="list-style-type: none"> <li>• How animals are unique to the area and not found anywhere else.</li> <li>• Uniqueness.</li> </ul>   |
| All of the Information            | 13%                 | <ul style="list-style-type: none"> <li>• Like all of it.</li> </ul>  |
| Geography of Madagascar           | 13%                 | <ul style="list-style-type: none"> <li>• The size of Madagascar.</li> <li>• Where it is located. How far it is from where we live. How long it would take for us to get there.</li> </ul>  |
| History of Dinosaurs              | 11%                 | <ul style="list-style-type: none"> <li>• History of dinosaurs in Madagascar. That would spark lots of interesting conversations.</li> <li>• How did dinosaurs go extinct?</li> </ul>   |
| Baobab Tree                       | 11%                 | <ul style="list-style-type: none"> <li>• The baobab trees.</li> </ul>  |
| Habitat Destruction in Madagascar | 9%                  | <ul style="list-style-type: none"> <li>• Why things are being destroyed.</li> <li>• Who destroys the island and how they did it.</li> </ul>  |
| Culture of Madagascar             | 9%                  | <ul style="list-style-type: none"> <li>• Culture.</li> <li>• How tenuous life is there.</li> </ul>   |
| Conservation                      | 9%                  | <ul style="list-style-type: none"> <li>• Talk about what humans can do to change the environment and how to prevent this.</li> <li>• Use them (animals) to explain the importance of conservation because of people causing too many to become extinct.</li> </ul>                 |
| Biodiversity in Madagascar        | 4%                  | <ul style="list-style-type: none"> <li>• Biodiversity hot spot.</li> <li>• The variety of plants and animals we don't have.</li> </ul>   |
| Orchids                           | 2%                  | <ul style="list-style-type: none"> <li>• The orchids.</li> </ul>   |
| Other                             | 4%                  | <ul style="list-style-type: none"> <li>• What the geology of the island is.</li> <li>• Venus fly traps.</li> </ul>   |

The exhibit provided an overview of what makes Madagascar an unique and interesting place. Keeping in mind the limited information provided, visitors were asked if they felt confident about anything they learned. Almost three-fourths of visitors (74%) said they felt more

confident. The rest of the visitors (26%) didn't feel there was enough information to increase their confidence. Visitors who felt confident about something they learned were asked to describe what they felt more confident about. Visitors' responses were coded into themes and representative responses are included for each (see Table 13). Visitors learned a variety of new information about Madagascar. The most commonly mentioned new knowledge related to the geography (27%), uniqueness (24%), and biological diversity (24%) of Madagascar.

Table 13: Topics Visitors Felt More Confident About (n=37)

| Theme                             | Percent of Visitors | Sample Responses   |
|-----------------------------------|---------------------|--|
| Geography of Madagascar           | 27%                 | <ul style="list-style-type: none"> <li>• The size of Madagascar (fourth largest island).</li> <li>• That I know where it is on the map.</li> </ul>                         |
| Uniqueness of Madagascar          | 24%                 | <ul style="list-style-type: none"> <li>• 80% of animals don't exist elsewhere.</li> <li>• Knowing that it is a unique place.</li> </ul>                                    |
| Biodiversity in Madagascar        | 24%                 | <ul style="list-style-type: none"> <li>• Diversity of animals.</li> <li>• I feel like I could tell people about the percentage of animals living in Madagascar.</li> </ul> |
| Habitat Destruction in Madagascar | 14%                 | <ul style="list-style-type: none"> <li>• The wildlife are all at risk of being extinct.</li> <li>• The destruction of the animals and the environment.</li> </ul>          |
| Orchids                           | 8%                  | <ul style="list-style-type: none"> <li>• Orchid species, I didn't know that before.</li> <li>• Lots of different orchids.</li> </ul>                                       |
| Baobab Tree                       | 5%                  | <ul style="list-style-type: none"> <li>• Baobab trees store water.</li> <li>• Baobab trees unique to that region.</li> </ul>   |
| Specific Animals of Madagascar    | 5%                  | <ul style="list-style-type: none"> <li>• Chameleons.</li> <li>• Lemurs.</li> </ul>   |
| Other                             | 5%                  | <ul style="list-style-type: none"> <li>• Very lively place. Lots of trees and forest.</li> </ul>   |

Using the Science Buzz Madagascar exhibit as a starting point for thinking about a future exhibit, visitors were asked what would make an exhibit about Madagascar more interesting. Their suggestions were coded into themes and representative responses are included for each (see Table 14). The most frequently mentioned changes were the addition of more plants and animals (either live or replicas). These suggestions can be used to address the strong visitor interest in animal-related topics that surfaced repeatedly throughout the interviews.

Table 14: Visitor Suggestions to Make A Madagascar Exhibit More Interesting (n=50)

| Theme   | Percent of Visitors | Sample Responses   |
|---|---------------------|--|
| Add Plants and/or Animals                     | 42%                 | <ul style="list-style-type: none"> <li>• Live chameleons. Live plants. Something you can touch.</li> <li>• Maybe some replicas of the animals so I could actually see what they look like.</li> <li>• It would be cool to have a huge tree. Show where it stores water and climb into it.</li> </ul> |
| Include Hands-On Activities                   | 32%                 | <ul style="list-style-type: none"> <li>• More hands-on activities.</li> <li>• Make it interactive.</li> <li>• Mini-environment for kids to play in.</li> </ul>   |
| More Visuals                                  | 24%                 | <ul style="list-style-type: none"> <li>• Play up the visual aspects of it. Beautiful, dramatic landscapes. Pictures speak for themselves.</li> <li>• Good way to display interesting facts, have an eye-catching display.</li> <li>• Add more pictures of the different animals.</li> </ul>          |
| Add Video                                     | 8%                  | <ul style="list-style-type: none"> <li>• Have videos.</li> <li>• Have movie clips from the kids' movie.</li> </ul>   |
| More Information About Dinosaurs              | 8%                  | <ul style="list-style-type: none"> <li>• The history of the dinosaurs.</li> <li>• Focus on dinosaurs.</li> </ul>   |
| More Information About Madagascar's Culture   | 8%                  | <ul style="list-style-type: none"> <li>• I would like to know more about the people and what they do and how they live with the changes going on to the animals and environment.</li> <li>• How people live.</li> </ul>  |
| More Information About Animals                | 8%                  | <ul style="list-style-type: none"> <li>• Highlight the interesting animals, especially chameleons and lemurs.</li> <li>• Talk more about animals. I think kids really like animals and I would like to find out more about the different species.</li> </ul>   |
| More Information About Madagascar's Geography | 4%                  | <ul style="list-style-type: none"> <li>• I would like to know more about the terrain and climate of Madagascar. The picture here kind of implies a rainforest, but then it also looks very dry where the trees are.</li> </ul>   |
| Other   | 10%                 | <ul style="list-style-type: none"> <li>• Have lectures, speakers.</li> <li>• Show different things we don't see. Showing the uniqueness of the area.</li> </ul>  |
| No Changes                                    | 6%                  | <ul style="list-style-type: none"> <li>• I think what you have is interesting. I wouldn't change anything.</li> </ul>  |

## **SCIENCE BUZZ WEBSITE USAGE STUDY**

In addition to a museum presence, Science Buzz has a web-based component. Visitors can access Science Buzz content both at and away from the museum. A study was carried out to understand visitor use of the website in order to identify future improvements.

Visitors age eight and above were invited to spend time using the Science Buzz website at the museum. A random sampling method was used in which the third eligible visitor to walk over an imaginary line was asked to participate in the study. Visitor usage of the site was tracked. Upon completion of navigating the site, visitors were interviewed. Observations and cued interviews were conducted with 59 visitors. Demographics for these visitors can be found in Appendix A.

### **Results and Discussion**

Visitors were tracked as they navigated the Science Buzz website. Each item (e.g., button or picture) a visitor clicked on was treated as a stop. Visitors had a median of 9 stops, with a maximum of 37 stops and a minimum of no stops beyond the home page. The sections of the site with the highest usage were related to content on the museum floor and the Buzz blog. Visitors' stops (n=611) were spread throughout the site, with the highest percentage of stops to individual blog stories (13%) and the Buzz kiosks (11%). Visitors with limited navigation through the site (five or less stops) had similar usage to the larger sample who made more than five stops on the site. Of the 58 total stops for the low usage visitors, the highest percentage of stops (21%) was to individual blog stories. When looking overall at how many of the 59 visitors stopped at each section of the website, visitors most frequently stopped at the At the Museum main page (66%), individual blog stories (56%), and The Buzz Blog main page (53%). Visitors finished their experience on the Science Buzz website at various sections of the site. The highest percentages of final stops were at the individual blog stories (15%) and At the Museum (12%). (See Appendix C for tables on percent of stops at sections of the site, percent of stops for visitors with five or less stops, percent of visitors stopping at the site's different sections, and exit points.)

Visitors were observed to see if they had any difficulties with the website or computer console. Only 29% of visitors exhibited difficulties. Of these 17 people, difficulties were primarily in relation to the computer terminal, with 53% having difficulties using a roller ball. Only 35% of these 17 visitors appeared to have difficulties navigating the site. When asked to rate ease of navigation on a 4-point scale, a majority of the visitors felt the website was easy or extremely easy to navigate (93%). Only 7% of the visitors thought the site was difficult to navigate, and none of the visitors considered the site extremely difficult to navigate.

Science Buzz is accessible online for visitors to use both at and away from the museum. Visitors were asked if they were aware of this (n=51 for this question). Only 20% of visitors knew they could access Science Buzz outside of the museum. Most visitors (80%) were unaware Science Buzz was a regular website. This lack of awareness could be attributed to the Science Buzz computer terminal layout in the museum, which excludes familiar features of a web page such as the browser window and web address.

Visitors were asked about their awareness of and participation in various activities on the website. Most visitors were aware they could search the site (88%) and participate in blog-

related activities such as leave my own comment (85%) and read other people’s conversations (75%) (see Table 15). About half of the visitors were unaware they could ask a scientist a question (59%), post their own science stories (54%), or vote in an online poll (46%). The activity in which the most visitors participated was reading other people’s conversations (50%).

Table 15: Participation in Activities on the Website (n=59)

|   | <b>I didn’t know<br/>I could do this</b> | <b>I chose not to<br/>do this</b> | <b>Did it</b> |
|---|--|-----------------------------------|---------------|
| Ask a scientist a question                    | 59%                                      | 37%                               | 3%            |
| Post my own science stories                   | 54%                                      | 41%                               | 5%            |
| Vote in the online poll                       | 46%                                      | 39%                               | 15%           |
| Read other people’s conversations on the site | 25%                                      | 25%                               | 50%           |
| Leave my own comment                          | 15%                                      | 66%                               | 19%           |
| Search to find specific content               | 12%                                      | 49%                               | 39%           |

Visitors who participated in an activity were asked to rate how difficult or easy it was to do the activity. Most visitors felt the activities were easy or extremely easy to use (see Table 16). However, of the visitors who voted in an online poll, 22% said it was difficult to vote, and some visitors mentioned that it was unclear how to cast their vote.

Table 16: Ease of Use For Activities on the Website

|   | <b>Extremely<br/>difficult to use</b> | <b>Difficult<br/>to use</b> | <b>Easy<br/>to use</b> | <b>Extremely<br/>easy to use</b> |
|---|---------------------------------------|-----------------------------|------------------------|----------------------------------|
| Ask a scientist a question (n=2)                        | 0%                                    | 0%                          | 100%                   | 0%                               |
| Post my own science stories<br>(n=3)                    | 0%                                    | 0%                          | 67%                    | 33%                              |
| Vote in the online poll (n=9)                           | 0%                                    | 22%                         | 33%                    | 44%                              |
| Read other people’s<br>conversations on the site (n=29) | 0%                                    | 0%                          | 62%                    | 38%                              |
| Leave my own comment (n=11)                             | 0%                                    | 0%                          | 64%                    | 36%                              |
| Search to find specific content<br>(n=23)               | 4%                                    | 0%                          | 61%                    | 35%                              |

There was high visitor interest in the Science Buzz website. Most visitors (91%) felt the website was interesting or extremely interesting (on a 4-point scale). Only 9% of visitors felt the site was boring or extremely boring. Visitors were asked what would make them likely to return to the Science Buzz website. Visitors’ responses were coded into themes and representative responses are included for each (see Table 17). A small number of visitors (10%) mentioned that current updates to the stories would increase their likelihood of returning to the Science Buzz website.

Presumably, these visitors did not realize that the stories were updated daily. There were some visitors (7%) who said they would return to the site as it was and had no suggestions.

Table 17: What Would Make Visitors Likely To Return to the Website (n=59)

| Theme                                    | Percent of Visitors | Sample Responses   |
|--|---------------------|--|
| Topics of Interest                       | 25%                 | <ul style="list-style-type: none"> <li>I didn't really see any topics that interested me. I would like to see more regularly studied fields. What connects the topics? I see butterflies and steroids. There's nothing there that makes me check into my areas of interest.</li> <li>Topics of interest like current medical, new developing things in science area.</li> <li>I like to read stories, especially about animals.</li> </ul> |
| Information About Museum and Area Events | 14%                 | <ul style="list-style-type: none"> <li>More about the exhibits on the homepage and new stuff around the museum.</li> <li>It's good. I'd comeback if I had something to look up like events in the area.</li> </ul>   |
| Ease in Finding the Site                 | 12%                 | <ul style="list-style-type: none"> <li>If I knew how to get to it.</li> <li>More advertised, so know about it.</li> </ul>  |
| Current Stories                          | 10%                 | <ul style="list-style-type: none"> <li>"Buzz" stories current</li> <li>Daily News.</li> <li>Monthly updates.</li> </ul>  |
| More Interactives and Visuals            | 10%                 | <ul style="list-style-type: none"> <li>More pictures and activities. Too much reading.</li> <li>If it had some sound and moving video that would be fun.</li> </ul>  |
| Changes to Layout                        | 10%                 | <ul style="list-style-type: none"> <li>No link to SMM teacher information in the Teacher Page. It is hard to find your way around the site. It would be very helpful to have a glossary or index running down the side so you wouldn't have to keep hunting around to find what's there.</li> <li>Lots of links for further info, some children friendly. Explain "read more". Is it article or more info?</li> </ul>                      |
| Appealing to Their Age                   | 7%                  | <ul style="list-style-type: none"> <li>Age demographic is not right. It looks too childlike.</li> <li>Probably wouldn't use it unless one of my kids asked me to search for something.</li> </ul>  |
| Keep It As Is                            | 7%                  | <ul style="list-style-type: none"> <li>I would return the way it is.</li> </ul>  |
| Other                                    | 3%                  | <ul style="list-style-type: none"> <li>Time.</li> </ul>  |
| Don't Know                               | 10%                 |  |

Visitors were asked about their frequency of visiting both museum and science websites. Overall, visitors reported that they go to science websites more frequently than museum websites (see Table 18). However, most visitors reported that they rarely visit museum websites (67%) or

science websites (41%). Science Buzz is a combination of both types of sites. One visitor mentioned, “*Didn’t think about going through museum website (to find science content), but now I will. Wish I would have thought about this before.*”

Table 18: Frequency of Visits to Website (n=58)

| <b>Frequency</b>        | <b>Percent of Visitors</b> |
|-------------------------|----------------------------|
| <i>Science Websites</i> |                            |
| Daily                   | 10%                        |
| Weekly                  | 12%                        |
| Monthly                 | 14%                        |
| Quarterly               | 9%                         |
| Annually                | 14%                        |
| Rarely                  | 41%                        |
| <i>Museum Websites</i>  |                            |
| Weekly                  | 2%                         |
| Monthly                 | 10%                        |
| Quarterly               | 14%                        |
| Annually                | 7%                         |
| Rarely                  | 67%                        |

### **Case Studies of Visitor Use of the Science Buzz Website**

Below are five case studies that illustrate the experiences that different types of users had with the Science Buzz website.

#### *Case Study of Visitor “Very Interested” in Science Buzz Website*

This visitor was a 46 year-old white, English-speaking female. She said she was extremely interested in the website. As for her interest in science, she responded that she was a “10” on a scale of 1 to 10, with 10 being extremely interested in science. She was from Rochester, MN and came to the museum with a group that included both adults (ages 65, 67, and 67) and a child (age 12). She was not a member of the museum, but noted that she usually was. During the past 2 years she visited the museum 3-5 times. She said that she visits museums quarterly and goes weekly to science websites. Although she rarely visits museum websites, she commented that she didn’t think about using museum websites, wishing that she would have thought about that before. She attained a post-graduate degree and had a total household income of \$100,000 to \$149,999.

Beginning at the Science Buzz homepage, this visitor stopped at a total of 15 places on the website. This is the path she took:

Individual Story (on the Buzz Blog)→ Hot Stories→ The Buzz → Hot Stories→ Learn More About Life Science→ Add a Comment→ Post Comment→ Hot Stories→ Recent Comment→ Outside Website→ Outside Website→ Search→ Individual Story (on the Buzz Blog) → Kiosks (Changing story from home page)→ Link to SMM site (Where you can find Kiosks in the museum)

This visitor was extremely interested in the website and felt it was easy to navigate. *“This is so cool.”* She did not realize the website was accessible outside the museum, and asked if she could access the site from home before the question was even asked. She didn’t know that she could ask a scientist a question or vote in an online poll. She chose not to post her own science story. She said it was extremely easy to leave her own comment, read other people’s conversations on the site, and search for specific content. When asked what would make her more likely to return to the Science Buzz website, she said she would want to see current and interesting stories or “Buzz” stories.

*Case Study of Visitor “Interested” in Science Buzz Website*

This 25 year-old English-speaking, white male, came to the museum with one other adult (18 years old) and was from Forest Lake, MN. He was interested in the Science Buzz website. He rated himself an 8 on a scale of 1 to 10 for interest in science, where 10 is extremely interested in science. He was not a member of the museum and had visited the museum 1-2 times in the past 2 years. He visits museums quarterly, never visits museum websites, and visits science websites monthly. He has a college degree and a household income of \$30,000 to \$39,999.

Beginning at the Science Buzz homepage, this visitor stopped at a total of 8 different places on the website. This is the path he took:

At the Museum → Buzz Kiosks → Article to Learn More (goes to SMM site that has more information about the kiosk topic) → At the Museum → Object of the Month → Community → Community Guidelines → At the Museum

This visitor said that the website was interesting. He made a suggestion to have a few different options on the website because he don't know how interested kids would be in these topics. He clicked on cleaning up the St. Croix because that's what he was interested in, but thought that most kids would not care. He thought the site was extremely easy to navigate, but that the roller ball was difficult and the button was too small and in an awkward place. He didn’t realize the website was accessible outside the museum and stated that there wasn’t an address anywhere on the site. He suggested that maybe it could have something at the bottom of the page with the web address (url) so it could be found. He noted that it was extremely easy to search to find specific content. He chose not to vote in the online poll, and was not aware he could do the following: ask a scientist a question, leave his own comment, post his own science stories, and read other people’s conversations on the site. When asked what would make him more likely to return to the Science Buzz website, he stated that having some sound and moving video would be fun.

*Case Study of Visitor Who Visits Science Websites “Daily”*

This 31 year-old white, English-speaking female reported that she visits science websites daily. She came from Brooklyn, Wisconsin with a 32 year-old adult. She was not a member of the museum and had not visited during the past 2 years. She had a college degree and had a household income of \$60,000 to \$69,999.

Beginning at the Science Buzz homepage, this visitor stopped at a total of 9 places on the website. This is the path she took:

Changing Story (Buzz Blog)→ Learn More about Earth and Space Science→ Image→ Learn More about History and Nature of Science→ Search (typed something in the search navigation bar)→ Article to Learn More→ Buzz Kiosks → Article to Learn More (about kiosk topic)→ Outside Website

This visitor said the website was interesting, but thought it seemed like it was written for a younger crowd. She felt it was extremely easy to navigate and had a lot of links. She was unaware that the Science Buzz website was accessible outside the museum. She made the comment that she did not know there was that much information on the site and suggested that the “Want to Learn More About” section have a list of contents at the top of the page. She also thought that adding page numbers would let you know that there is more to look at. This woman was unaware that she could ask a scientist a question, post her own science stories, or vote on the online poll, but chose not to leave her own comment. She felt it was easy to read other people’s conversations on the site and extremely easy to search to find specific content. She said that after realizing there was so much content, having subtopics on the top of the page to notify her of the availability of more information would make her more likely to return to the Science Buzz website. This person visits museums annually, goes quarterly to museum websites, and visits science websites daily.

#### *Case Study of Visitor who “Rarely” Visits Science Websites*

This visitor was a 16-year-old English speaking, white male from Wrenshall, MN. He came with a large school group between the ages of 16 to 18. On a scale of 1 to 10, where 1 is not at all interested in science and 10 is extremely interested, he rated his level of interest as a 3. He was not a member of the museum and had visited the museum 1 to 2 times during the last 2 years. He was unsure of his household income.

Beginning at the Science Buzz homepage, this visitor stopped at a total of 8 places on the website. This is the path he took:

Poll → The Buzz → At the Museum → Individual Story (on the Buzz Blog)→ Individual Story (on the Buzz Blog) → Individual Story (on the Buzz Blog) → Community → Object of the Month

The visitor found the website to be interesting and easy to navigate. It was noted, however, during the observations that he appeared unsure of how to navigate the site. The visitor did not know that this website could be accessed outside the museum. When the visitor was given a list of other things he could do on the website, the visitor responded that he chose not to ask a scientist a question, leave a comment, post his own stories, read other people’s conversations on the site, search to find specific content and vote in the online poll. The visitor said that he would be likely return to the website if there were more things going on. This person rarely visits museums, rarely visits museum website, and rarely visits science websites.

*Case Study of Visitor who “Rarely” Visits Science Websites*

This visitor was a 16-year-old white female, whose primary languages were French and German. She came with a school group and was from Echo, Minnesota. On a scale of 1 to 10, with 10 being extremely interested in science, she had rated her interest in science as a 7. She was not a member of this museum and had visited the museum 1-2 times in the past 2 years. Her household income was under \$30,000.

Beginning at the Science Buzz homepage, this visitor stopped at a total of 10 places on the website. This is the path she took:

Science News → At the Museum → Headliner → Headliners (individual topics related to Headline Exhibit) → Headliners (individual topics related to Headline Exhibit) → Community → About → Science Buzz Homepage → Body Worlds Forum → Science Buzz Homepage

It appeared that she had difficulty using the mouse when she was at the computer and asked, “Where’s the mouse?” She reported that the website was interesting but that it was difficult to navigate. She did not know it was accessible outside the museum. She did not know she could ask a scientist a question, post her own science stories, nor search to find specific content. She chose not to leave her own comment, read other people’s conversations on the site, and vote on the online poll. She responded that having the news and more pictures on the Science Buzz website would make her more likely to return. This person visits museums annually, rarely visits museum websites, and rarely visits science websites.

## APPENDIX A: Visitor Demographics for Science Buzz Evaluations

### Visitors Perceptions of Science Buzz Interview Demographics (n=50)

\*Demographics gathered through observations.

|                          |                              |              |
|--------------------------|------------------------------|--------------|
| <u>Sex</u>               | <u>Interest in Science</u>   | <u>Age</u>   |
| Female: 58%              | Self rating 1-5: 10%         | 8 - 12: 14%  |
| Male: 42%                | Self rating 6-10: 90%        | 13 - 16: 8%  |
|                          |                              | 17 - 24: 10% |
| <u>Group Composition</u> | <u>Knowledge in Science</u>  | 25 - 34: 14% |
| Adults & kids: 84%       | Self rating 1-5: 44%         | 35 - 44: 30% |
| Adults only: 16%         | Self rating 6-10: 56%        | 45 - 54: 6%  |
|                          |                              | 55 - 64: 10% |
| <u>Language</u>          | <u>First Visit to Museum</u> | 65+: 8%      |
| 4% were ESL but fluent.  | No: 82%                      |              |
|                          | Yes: 18%                     |              |

### Science Buzz Exhibition Level 3 Timing and Tracking Demographics (n=209)

\*Demographics gathered through observations.

|                          |              |
|--------------------------|--------------|
| <u>Sex</u>               | <u>Age</u>   |
| Female: 52%              | 8 - 12: 28%  |
| Male: 48%                | 13 - 16: 16% |
|                          | 17 - 24: 10% |
| <u>Group Composition</u> | 25 - 34: 11% |
| Adults & kids: 37%       | 35 - 44: 20% |
| Adults only: 30%         | 45 - 54: 15% |
| Kids only: 33%           | 55 - 64: 1%  |
|                          | 65+: 1%      |
| <u>Language</u>          |              |
| Less than 2% were ESL.   |              |

**Science Buzz Exhibition Level 5 Timing and Tracking Demographics (n=221)**

\*Demographics gathered through observations.

|                          |              |
|--------------------------|--------------|
| <u>Sex</u>               | <u>Age</u>   |
| Female: 53%              | 8 - 12: 21%  |
| Male: 47%                | 13 – 16: 11% |
|                          | 17 – 24: 11% |
| <u>Group Composition</u> | 25 – 34: 12% |
| Adults & kids: 52%       | 35 – 44: 22% |
| Adults only: 26%         | 45 – 54: 13% |
| Kids only: 20%           | 55 – 64: 7%  |
|                          | 65+: 3%      |
| <u>Language</u>          |              |
| Less than 2% were ESL.   |              |

**Scientist on the Spot Observation and Interviews Demographics (n=50)**

\*Demographics gathered through observations.

|                          |                             |              |
|--------------------------|-----------------------------|--------------|
| <u>Sex</u>               | <u>Interest in Science</u>  | <u>Age</u>   |
| Female: 58%              | Self rating 1-5: 10%        | 8 - 12: 14%  |
| Male: 42%                | Self rating 6-10: 90%       | 13 – 16: 8%  |
|                          |                             | 17 – 24: 10% |
| <u>Group Composition</u> | <u>Knowledge in Science</u> | 25 – 34: 14% |
| Adults & kids: 84%       | Self rating 1-5: 44%        | 35 – 44: 30% |
| Adults only: 16%         | Self rating 6-10: 56%       | 45 – 54: 6%  |
|                          |                             | 55 – 64: 10% |
| <u>Language</u>          |                             | 65+: 8%      |
| 4% were ESL but fluent.  |                             |              |

**Madagascar Interview Demographics (n=50)**

\*Demographics gathered through observations.

|                                     |                             |              |
|-------------------------------------|-----------------------------|--------------|
| <u>Sex</u>                          | <u>Interest in Science</u>  | <u>Age</u>   |
| Female: 58%                         | Self rating 1-5: 12%        | 8 - 12: 8%   |
| Male: 40%                           | Self rating 6-10: 88%       | 13 – 16: 4%  |
| *There was no data for one visitor. |                             | 17 – 24: 10% |
|                                     | <u>Knowledge in Science</u> | 25 – 34: 24% |
| <u>Group Composition</u>            | Self rating 1-5: 62%        | 35 – 44: 42% |
| Adults & kids: 66%                  | Self rating 6-10: 38%       | 45 – 54: 12% |
| Adults only: 34%                    |                             | 55 – 64: 0%  |
|                                     |                             | 65+: 0%      |
| <u>Language</u>                     |                             |              |
| No visitors appeared to be ESL.     |                             |              |

**Science Buzz Web Site Demographics**

\*Demographics self-reported by visitors.

Sex (n=59)

Females: 59%  
Males: 41%

Group Composition (n=59)

School Group: 46%  
Adults only: 36%  
Adults & kids: 15%  
Alone: 3%

Number of Other Visitors in Group (n=31)

\*Does not include school groups.  
Median: 2  
Minimum: 0  
Maximum: 8

Ages of Other Visitors in Group (n=73)

Median: 28  
Minimum: 2  
Maximum: 70

Language (n=59)

2% were ESL (French/German).

Ethnicity (n=59)

White: 97%  
South Asian: 2%  
Asian: 2%

Interest in Science (n=59)

Self rating 1-5: 14%  
Self rating 6-10: 86%

SMM Members (n=59)

No: 88%  
Yes: 8%  
Unsure: 3%

Number of Visits to SMM in the Last 2 Years (n=59)

None: 27%  
1-2: 54%  
3-5: 14%  
More than 5: 5%

Frequency of Visits to Museums (n=59)

Monthly: 19%  
Quarterly: 32%  
Annually: 20%  
Rarely: 29%

Age Range (n=59)

8 - 12: 22%  
13 - 16: 17%  
17 - 24: 22%  
25 - 34: 19%  
35 - 44: 7%  
45 - 54: 10%  
55 - 64: 3%  
65+: 0%

Age (n=59)

Median: 19  
Minimum: 9  
Maximum: 62

Education (n=59)

*\*All visitors with less than a high school education were age 18 or younger.*

Less than High School: 44%  
Completed High School: 3%  
Some College/Technical School: 15%  
College Degree: 27%  
Post-grad Degree: 10%

Household Income (n=59)

Under 30,000: 12%  
\$30000 to 39999: 12%  
\$40000 to \$49999: 3%  
\$50000 to \$59999: 7%  
\$60000 to \$69999: 5%  
\$70000 to \$79999: 3%  
\$80000 to \$89999: 3%  
\$90000 to \$99999: 3%  
\$100000 to \$149999: 5%  
\$150000+: 10%  
No info provided: 42%

## APPENDIX B: Additional Science Buzz Exhibitions Timing and Tracking Results

Table 19: Time Spent at Level 3 Science Buzz Exhibits

| <b>Exhibit</b>               | <b>Median Time</b> | <b>Minimum Time</b> | <b>Maximum Time</b> |
|------------------------------|--------------------|---------------------|---------------------|
| Quiz Show (n=135)            | 3 min, 4 sec       | 3 sec               | 14 min, 21 sec      |
| Scientist on the Spot (n=50) | 57 sec             | 3 sec               | 5 min, 50 sec       |
| Computer (n=27)              | 45 sec             | 5 sec               | 3 min, 21 sec       |
| Post-it notes (n=17)         | 37 sec             | 5 sec               | 4 min, 18 sec       |
| Orientation (n=27)           | 34 sec             | 4 sec               | 3 min, 1 sec        |
| Bones (Right) (n=35)         | 20 sec             | 4 sec               | 1 min, 15 sec       |
| Slides (n=18)                | 12 sec             | 3 sec               | 1 min, 38 sec       |
| Bones (Left) (n=25)          | 9 sec              | 3 sec               | 1 min, 31 sec       |

Table 20: Time Spent at Level 5 Science Buzz Exhibits

| <b>Exhibit</b>               | <b>Median Time</b> | <b>Minimum Time</b> | <b>Maximum Time</b> |
|------------------------------|--------------------|---------------------|---------------------|
| TV active (n=107)            | 1 min, 23 sec      | 3 sec               | 10 min, 28 sec      |
| Couch (n=12)                 | 59 sec             | 9 sec               | 19 min, 36 sec      |
| TV viewing (n=88)            | 35 sec             | 4 sec               | 4 min, 37 sec       |
| Scientist on the Spot (n=39) | 33 sec             | 4 sec               | 4 min, 18 sec       |
| Objects (n=53)               | 33 sec             | 1 sec               | 2 min, 41 sec       |
| Web (n=45)                   | 32 sec             | 6 sec               | 14 min, 27 sec      |
| Headline (n=34)              | 26 sec             | 3 sec               | 6 min, 13 sec       |
| Introduction (n=18)          | 23 sec             | 2 sec               | 1 min, 20 sec       |
| Orientation (n=38)           | 12 sec             | 3 sec               | 6 min, 27 sec       |

Table 21: Observed Behaviors at Level 3 Science Buzz Exhibits

| <b>Exhibit</b>                  | <b>Interact With Exhibit</b> | <b>Read</b> | <b>Talk to Other Visitors</b> | <b>Observe</b> | <b>Glance</b> | <b>Point</b> | <b>Read Out Loud</b> | <b>Call/ Called Over</b> |
|---------------------------------|------------------------------|-------------|-------------------------------|----------------|---------------|--------------|----------------------|--------------------------|
| Quiz Show<br>(n=135)            | 84%                          | 63%         | 76%                           | 25%            | 4%            | 14%          | 15%                  | 10%                      |
| Scientist on the Spot<br>(n=50) | 42%                          | 66%         | 36%                           | 20%            | 22%           | 8%           | 0%                   | 6%                       |
| Bones (Right)<br>(n=35)         | N/A                          | 66%         | 17%                           | 3%             | 31%           | 3%           | 0%                   | 0%                       |
| Orientation<br>(n=27)           | 59%                          | 67%         | 37%                           | 7%             | 11%           | 15%          | 7%                   | 11%                      |
| Computer<br>(n=27)              | 26%                          | 48%         | 56%                           | 52%            | 15%           | 19%          | 7%                   | 4%                       |
| Bones (Left)<br>(n=25)          | N/A                          | 40%         | 20%                           | 0%             | 60%           | 12%          | 0%                   | 0%                       |
| Slides<br>(n=18)                | 28%                          | 33%         | 22%                           | 0%             | 44%           | 11%          | 0%                   | 0%                       |
| Post-it notes<br>(n=17)         | 18%                          | 76%         | 47%                           | 6%             | 18%           | 18%          | 0%                   | 6%                       |

Table 22: Observed Behaviors at Level 5 Science Buzz Exhibits

| <b>Exhibit</b>               | <b>Interact With Exhibit</b> | <b>Read</b> | <b>Talk to Other Visitors</b> | <b>Observe</b> | <b>Glance</b> | <b>Point</b> | <b>Read Out Loud</b> | <b>Call/ Called Over</b> |
|------------------------------|------------------------------|-------------|-------------------------------|----------------|---------------|--------------|----------------------|--------------------------|
| TV active (n=107)            | 46%                          | 28%         | 82%                           | 42%            | 3%            | 25%          | 41%                  | 17%                      |
| TV viewing (n=88)            | 1%                           | N/A         | 55%                           | 89%            | 3%            | 10%          | N/A                  | 8%                       |
| Objects (n=53)               | 4%                           | 75%         | 66%                           | 9%             | 9%            | 40%          | 9%                   | 13%                      |
| Web (n=45)                   | 42%                          | 42%         | 56%                           | 33%            | 20%           | 18%          | 7%                   | 9%                       |
| Scientist on the Spot (n=39) | 26%                          | 62%         | 36%                           | 21%            | 23%           | 8%           | 8%                   | 5%                       |
| Orientation (n=38)           | 3%                           | 47%         | 24%                           | 0%             | 45%           | 5%           | 5%                   | 0%                       |
| Headline (n=34)              | 53%                          | 53%         | 44%                           | 21%            | 15%           | 12%          | 12%                  | 18%                      |
| Introduction (n=18)          | 6%                           | 33%         | 33%                           | 22%            | 33%           | 6%           | 6%                   | 0%                       |
| Couch (n=12)                 | N/A                          | 17%         | 58%                           | 42%            | 17%           | 0%           | 0%                   | 0%                       |

## APPENDIX C: Additional Science Buzz Website Usage Results

Table 23: Percent of Stops per Section of the Science Buzz Website (n=611)

| <b>Section</b>                          | <b>Percent of Stops</b> |
|---|-------------------------|
| Individual Stories                      | 13%                     |
| Kiosk                                   | 11%                     |
| At the Museum                           | 9%                      |
| The Buzz Blog                           | 7%                      |
| Community                               | 4%                      |
| Image                                   | 4%                      |
| Science Buzz Home                       | 4%                      |
| Hot Stories                             | 4%                      |
| Science News Story                      | 4%                      |
| Headliner                               | 4%                      |
| Science News                            | 3%                      |
| Other                                   | 3%                      |
| Seasons                                 | 3%                      |
| More info (linked text to outside site) | 3%                      |
| Object of the Month                     | 3%                      |
| Body Worlds Forum                       | 3%                      |
| Changing Story                          | 3%                      |
| Recent Comments                         | 2%                      |
| About                                   | 2%                      |
| Polls                                   | 2%                      |
| Individual Object                       | 1%                      |
| Mystery Object                          | 1%                      |
| Individual Polls                        | 1%                      |
| Learn More About                        | 1%                      |
| Search                                  | 1%                      |
| Add Comment                             | 1%                      |
| SMM Link                                | 1%                      |
| Scientist on the Spot                   | 1%                      |
| Post Comment                            | 1%                      |
| Teachers                                | 1%                      |

Table 24: Percent of Visitors Stopping at Sections of the Science Buzz Website (n=59)

| <b>Section</b>                          | <b>Percent of Visitors</b> |
|---|----------------------------|
| At the Museum                           | 66%                        |
| Individual Stories                      | 56%                        |
| The Buzz Blog                           | 53%                        |
| Kiosk                                   | 37%                        |
| Community                               | 34%                        |
| Body Worlds Forum                       | 29%                        |
| Object of the Month                     | 27%                        |
| Science Buzz Home                       | 27%                        |
| Image                                   | 25%                        |
| Science News Story                      | 25%                        |
| Hot Stories                             | 24%                        |
| Science News                            | 24%                        |
| More info (linked text to outside site) | 20%                        |
| Other                                   | 19%                        |
| Changing Story                          | 19%                        |
| Recent Comments                         | 19%                        |
| About                                   | 19%                        |
| Headliner                               | 17%                        |
| Polls                                   | 15%                        |
| Individual Object                       | 15%                        |
| Mystery Object                          | 14%                        |
| Seasons                                 | 10%                        |
| Individual Polls                        | 10%                        |
| Learn More About                        | 10%                        |
| Search                                  | 10%                        |
| Add Comment                             | 8%                         |
| SMM Link                                | 8%                         |
| Scientist on the Spot                   | 8%                         |
| Post Comment                            | 8%                         |
| Teachers                                | 7%                         |

Table 25: Sections Where Visitors Exited the Site (n=59)

| <b>Section</b>   | <b>Percent of Visitors</b> |
|--|----------------------------|
| Individual Stories   | 15%                        |
| At the Museum  | 12%                        |
| Science News Story   | 8%                         |
| Science Buzz home page   | 7%                         |
| Community  | 7%                         |
| Image (Two in buzz blog stories, one in Object of the Month, one in Seasons) | 7%                         |
| The Buzz main page   | 5%                         |
| SMM Link   | 3%                         |
| Kiosk  | 3%                         |
| Body Worlds Forum  | 3%                         |
| About  | 3%                         |
| More info (linked text to outside site)                                      | 3%                         |
| Hot Stories  | 3%                         |
| Post a Comment   | 3%                         |
| Add a Comment  | 1%                         |
| Individual Polls   | 2%                         |
| Learn more about...  | 2%                         |
| Changing Story (from home page)  | 2%                         |
| Search   | 2%                         |
| Scientist on the Spot  | 2%                         |
| Object of the Month  | 2%                         |
| Individual Object  | 2%                         |
| Other (Feedback section)   | 2%                         |